THE

physical therapy

REVIEW

Volume 32 - Number 8 August 1952

Quadriceps Femoris Strength Following Patellectomy—KATZ

Advanced Skills for the Bilateral Above-Knee Amputee—HOPKINS

A Passive Exerciser, Used Actively—STORMS

Extension Contracture of the Knee Joint —AVIGNON and AVIGNON

PUBLISHED MONTHLY BY
THE AMERICAN PHYSICAL THERAPY ASSOCIATION

the BIRTCHER Hyfrecator

ABIDING VALUES

There are some things that take on added value as time goes by – regardless of first cost. Such is the Hyfrecator. So many doctors have told us that it is "The handiest little device I ever had in my office." It performs so many useful jobs simply and satisfactorily. Over 80,000 doctors are proving this in everyday practice. The Hyfrecator is so inexpensive, too. Let us tell you all about it – you, too, can use it to advantage dozens of times every month. What for? It's too long a story to tell here – write for complete information. Free.

Write now for descriptive literature HYFRECATOR

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

THE BIRTCHER CORPORATION
4371 Valley Blvd.
Los Angeles 32, Calif.

MEDCOLATOR

USES IN ELECTRICAL MUSCLE STIMULATION ADJUNCT THERAPY

1. For
   - . . . Strains
   - . . . Sprains
   - . . . Dislocations
   - . . . Other trauma of muscle and skeletal system

   Assisting through muscle contraction in:
   a. The Removal and Resolution of Exudates
   b. Reduction of Edema
   c. Stimulation of Blood and Lymph Flow

2. To Retard Atrophy

3. For Muscle Re-education . . . It helps to Re-establish Muscle Sense

4. To help Regain and Preserve Mobility and Function of Muscles. An Ancillary to Massage. . . Drugs. . . Heat Therapy. . . Or May Be Used Alone

Write for literature or demonstration

MEDCO PRODUCTS CO.
3608 E. Admiral Place Tulsa 12, Oklahoma
P.O. Box 3275 Dept. R

acme skis *Pat. Pending*

RECIPROCAL MOTION
FOR CHILDREN AND ADULTS
THREE SIZES

Walking aid . . . . . Balance Training
Reciprocal motion of arms and legs in walking pattern.

For Further Information Write:

acme skis *Sole Distributors*
2805 S Fairfax Ave. Los Angeles 16, Calif.

THREE-MONTH POSTGRADUATE COURSE IN CEREBRAL PALSY

(limited at this time to qualified physicians, physical and occupational therapists)

Dates: September 22 - December 12, 1952

A professional statement of completion will be granted by Columbia University upon satisfactory completion of the three-month course.

A list of available sources for study scholarships which include living stipend will be sent upon request.

Sponsored by

THE COORDINATING COUNCIL FOR CEREBRAL PALSY IN NEW YORK CITY, INC.

In Cooperation with

COLLEGE OF PHYSICIANS AND SURGEONS, COLUMBIA UNIVERSITY

and the various diagnostic and treatment centers of Greater New York

For full information write

MISS MARGUERITE ABBOTT, *Executive Director*
Coordinating Council for Cerebral Palsy
270 Park Avenue, New York 17, New York

THE KABAT-KAISER INSTITUTE
At Vallejo, California

Announces

THREE MONTHS' POSTGRADUATE COURSES FOR PHYSICAL THERAPISTS IN TECHNICS OF NEUROMUSCULAR REEDUCATION

Physical therapists must be members of the American Physical Therapy Association, members of the American Registry of Physical Therapists, or qualified foreign physical therapists.

Courses start October 1st, January 1st, April 1st, and July 1st

Number of students accepted is limited. Certificate given upon successful completion of the course.

TUITION: $150

Applicants should communicate with:

Margaret Knott, Chief Physical Therapist
Kabat-Kaiser Institute
Vallejo, California

ILLE Equipment for Subaqua Hydromassage and Thermal Therapy

ILLE precision-engineered Physical Therapy Equipment — distinguished for its excellence of design, quality of materials and range of types — includes: Hydrotherapy Tank Units, Paraffin Baths, Mobile Sitz Bath, Folding Thermostatic Bed Tent, etc. Literature on request.

ILLE
ELECTRIC CORPORATION
50 Mill Road, Freeport, L. I., N.Y.

Combination Hydromassage Wading and Treatment Tank, Model HM-1100. →
← Combination Arm, Leg, and Hip Tank, Stationary Model HM-600.

RESTORATOR

FOR UPPER AND LOWER EXTREMITIES

A wide range of usefulness for therapeutic exercise

Literature upon request

American Restorator Inc.
640 Madison Avenue
New York 22, N. Y.
Tel.: PLaza 3-7127

Classified WANT-ADS

• • •

Want-ads appear in **THE PHYSICAL THERAPY REVIEW** under two classifications—positions available and positions wanted.

For further information and rates, see page 435.

Dear Reader:

Your *Review*, as second class mail, is NOT forwarded to your new address when you move. If one or more of your copies is not received, we cannot guarantee that they may be duplicated.

Therefore, to insure uninterrupted delivery, please send your change of name and/or address, including your old address, to the American Physical Therapy Association, 1790 Broadway, New York 19, N. Y., five weeks in advance.

May we suggest that students who expect several address changes during clinical practice request that the *Review* be sent to their home address.

Sincerely yours,

—BUSINESS OFFICE
Physical Therapy Review

REVIEW SUBSCRIBERS CAN USE UNESCO PLAN

The PHYSICAL THERAPY REVIEW offices have been informed that foreign orders for subscriptions to the REVIEW, or for single copies, may be placed through the UNESCO Book Coupon Plan. The Plan was established by the United Nations Educational, Scientific, and Cultural Organization to enable individuals and institutions in certain foreign countries to purchase American books and periodicals despite the dollar shortage. (The American Booksellers Association, Inc., has been designated by the United States State Department to handle the Plan in this country.)

UNESCO Book Coupons may be obtained at the Central Distributing Centers in all participating countries. (See list of Distribution Centers.)

Coupons are purchased in the currency of the participating country, thus by-passing the prohibitive dollar exchange. These coupons may be sent directly to the *American Booksellers Association, Inc., 72 Fifth Avenue, New York 19, N. Y.*, by the individual or by his bookstore. (The foreign subscription price per year is $6.75 for the REVIEW, which is published by the American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.)

DISTRIBUTION CENTERS

Czechoslovakia—Orbis Co., Stalinova 46, Prague XII
Egypt—Administration of General Culture, Ministry of Education, Cairo
France—Direction des Bibliotheques de France, 55 rue St. Dominique, Paris 7e
India—Ministry of National Education, Government of India, New Delhi
United Kingdom—UNESCO Book Coupons, c/o Book Tokens, Ltd., 28 Little Russell Street, London, England
Israel—Dr. G. J. Ehrlich, Import Licensing Office, Ministry of Education and Culture, Hakirya
Germany (Bundesrepublick)—Notgeminschaft der deutschen Wissenschaft, Buechelstrasse 55, Bad Godesberg
Iran—The President of the Persian National Commission for UNESCO, Avenue du Musee, Teheran
South Africa—The Department of Education, Arts, and Science, New Standard Bank Buildings, Pretoria
Italy—Italian National Commission for UNESCO, Villa Massimo, Largo di via Villa Massimo, 2, Roma
Burma—The Secretary, Provisional National Commission, Secretariat Buildings, Rangoon
Indonesia—The Ministry of Education and Culture, Djalan Tjilatjap 4, Djakarta
Thailand—Thailand National Commission for UNESCO, c/o Ministry of Education, Bangkok
Hungary—Ibusz Company, Akademia-utca 10, Budapest V

DANIEL INSTITUTE, INC.
for Prosthetic Service and Rehabilitation

For Physicians and Graduate Physical Therapists
A Five-week Course in Prosthetic Service
Beginning Aug. 15, Oct. 1, Nov. 15, 1952,
Jan. 15, Mar. 1, Apr. 15, June 1, 1953.
Course for Physicians, Oct. 1.

Instruction will include: Limb prescription and WHY; measurements, taking casts, fittings, alignment, evaluation; balance and gait training; arm training, and devices including control harness.

Discussion of materials—plastic, willow, metal, leather; types of sockets—slip, suction, conventional soft and hard sockets; new developments of the National Research Council.

Tuition $125—6 text books furnished.

Applicants must be physicians or members of the American Physical Therapy Association or senior registrants of the American Registry of Physical Therapists. Graduates of approved foreign physical therapy schools will be considered.

•

For application blanks write:

Earle H. Daniel, Director
Daniel Institute, Inc.
619-621 W. Broward Blvd.
Ft. Lauderdale, Florida

Georgia Warm Springs Foundation
GRADUATE COURSE
Physical Therapy and Occupational Therapy in the Care of Poliomyelitis

This course is open to graduates of approved schools in physical therapy and occupational therapy. Such graduates must be members of the American Physical Therapy Association and/or the American Registry of Physical Therapy Technicians, and Occupational Therapy Association.

Tuition: None. For scholarship to cover transportation and maintenance, contact National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

Entrance Dates: First Monday in January, April, July and October.

Duration of Course: The course is divided into two parts:

Part I. Over-all care of convalescent polio with particular emphasis and special training in muscle testing and muscle reeducation.

Part II. Particular emphasis and special training in functional testing and functional retraining.

Each part lasts three months and only selected students who have completed Part I will be admitted to Part II. All students applying for Part I must be willing to remain through Part II if selected.

For Information Write:
Robert L. Bennett, M.D.
Georgia Warm Springs Foundation
Warm Springs, Georgia

J. A. PRESTON CORPORATION NEW YORK U.S.A.

a COMPLETE LINE of Equipment for

PHYSICAL MEDICINE AND REHABILITATION

REHABILITATION: Progressive Resistance Exercise Units; **Walking Parallel Bars and Exercise Staircases** of various designs; Invalid Walkers; Posture Training Mirrors, single and triple; Stall Bars; Pulley Weights; **Shoulder Wheels;** Shoulder Ladder; Supinator-Pronator; various types of **Bicycle Exercisers; Restorator,** a new device for active exercise of upper and lower extremities; Kanavel Table; **Manuflex,** with the new "Gym Kit" for hand therapy; Ankle exercisers; **Quadriceps-Gastrocnemius-Footdrop Boots;** Foldaway Jim, a gymnasium for the office or patient's home; **Sayre's Headslings,** with or without scales to measure amount of traction; **Gymnasium Mats** in various sizes, thicknesses and coverings; **Crutches and Canes;** Cerebral Palsy Equipment.

PHYSICAL THERAPY: Whirlpools for every use; Paraffin Baths; **"Moistaire"** Heat Therapy Units; **Hydrocollator** Master Units and Steam Packs; **Shortwave** Diathermy Units, "Hanovia" and other makes; **Galvanic-faradic-sinusoidal** Generators; Hanovia Ultraviolet Lamps; Heat Lamps and Bakers; **Ultrasonic** Generators; Treatment Tables; Timers.

DIAGNOSTIC APPARATUS: Chronaximeters; Electromyographs; Dynamometers; Ergographs; Goniometers; Oscillometers; Thermocouples.

TEXTBOOKS—of interest to the physical therapist.

ALL your needs supplied by ONE reliable source.

Send for your free copy of our new illustrated Catalog No. 1052 which has just come off the press. Inquiries invited.

J.A.PRESTON CORPORATION
175 FIFTH AVE. • NEW YORK 10, N.Y. • ORegon 4-9044

THE physical therapy REVIEW

400 Vol. 32, No. 8

published monthly by the
American Physical Therapy Association
at 1790 Broadway, Room 1315
New York 19, N. Y.

Editor: E. JANE CARLIN

Associate Editors: DANIEL R. BARTHOLOMEW, MARY E. CALLAHAN, LOUISE REINECKE

Managing Editor: CAROL VANCE

Assistant Business Manager: SHIRLEE STERN

Membership in the American Physical Therapy Association is $15.00 a year, including a subscription to THE PHYSICAL THERAPY REVIEW. Subscriptions for nonmembers to THE PHYSICAL THERAPY REVIEW, $6.00 a year; $6.75 in Canada and foreign countries. Single copies 75 cents. (50 cents to members.) Reentered as second class matter August 11, 1949, at the post office at New York, N. Y., under the act of August 24, 1912.

The statements in the manuscripts published in THE PHYSICAL THERAPY REVIEW are made solely on the responsibility of the author. The American Physical Therapy Association does not assume any responsibility for statements contained therein. Manuscripts accepted for publication in THE PHYSICAL THERAPY REVIEW are for exclusive publication and may not be published elsewhere without permission.

Officers

President — Mary Clyde Singleton
Vice-president — Harriet S. Lee
Secretary — Marian Williams
Treasurer — Margaret Kohli
Speaker, House of Delegates — Mary E. Nesbitt

Directors

LOUISE A. BAILEY — Chicago, Ill.
MARGUERITE I. IRVINE — Seattle, Wash.
MARGARET A. KOHLI — Madison, Wis.
SUSAN G. ROEN — Los Angeles, Calif.

Advisory Council

DONALD COVALT, M.D. — New York, N. Y.
EMIL D. W. HAUSER, M.D. — Chicago, Ill.
HUGO V. HULLERMAN, M.D. — New York, N. Y.
CHARLES O. BECHTOL, M.D. — Oakland, Calif.
AURA SEVERINGHAUS, PH.D. — New York, N. Y.

Standing Committees

Education—
FLORENCE S. LINDUFF — Washington, D. C.
Exhibits—
MIRIAM L. RODENBERGER — East St. Louis, Ill.
Interprofessional Relations—
MRS. ANNETTA VINCENT — Fort Lupton, Colo.
Nominations—JESSIE STEVENSON, Nashville, Tenn.
Program—MARIAN WILLIAMS, Palo Alto, Calif.
Publication—E. JANE CARLIN — Jenkintown, Pa.
Public Laws—
VIRGINIA GREENWOOD — Boston, Mass.
Public Relations—
DOROTHY E. VOSS — Vallejo, Calif.

National Office Staff

Executive Director — Mildred Elson
Assistant Executive Director — Mary E. Haskell
Educational Consultant — Dorothy R. Hewitt
Poliomyelitis Consultants — Lucy Blair, Ruth Whittemore

Table of Contents:

Quadriceps Femoris Strength Following Patellectomy—B. Lee Katz 401

Advanced Skills for the Bilateral Above-Knee Amputee—Jessica A. Hopkins . . 405

A Passive Exerciser, Used Actively—Harold D. Storms, M.D. 411

Extension Contracture of the Knee Joint—Miriam Avignon and Martin Avignon, Jr. 413

Meet Our New Contributors 404

Index to Current Literature 414

Reprints Available 415

Editorials 416

World Confederation for Physical Therapy 417

Membership News 419

Abstracts 422

Book Reviews 429

Our Book Reviewers for August 432

List of Approved Schools 433

Chapter Directory 436

Available in a Microfilm Edition

The Physical Therapy Review

Official Publication of The American Physical Therapy Association

Volume 32 **August 1952** **Number 8**

Quadriceps Femoris Strength Following Patellectomy*

B. Lee Katz, M.A.

The function of the patella has been a matter of controversy for decades. Whether or not the action of the quadriceps femoris is enhanced by the presence of the patella is a question which has led to much interest.

According to Morris the combined tendon of the quadriceps femoris is in part attached to the superior and lateral margins of the patella, and in part extends over the patella into the patellar ligament. Morris, Gray, and Spalteholz all describe tendon fibers of the vastus medialis and vastus lateralis inserting into the patella, and some fibers passing on either side of the pattella. Those fibers which pass along the sides of the patella, the medial and lateral patellar retinacula, are very important to the function of the patellectomized knee.

With knee extension the patella rises over the femoral condyles, so that with full extension only the lower third of the articular surface of the patella rests upon the femoral condyles. In extreme flexion, the anterior surface of the condyles affords leverage to the quadriceps femoris as the patella projects very little. When the leg is semiflexed, the middle third of the patella rests upon the most prominent part of the condyles.

Physical therapist in private practice.

*Abstract of a master's thesis submitted at Stanford University, Division of Physical Therapy, June, 1951.

Sixty-four authors who discussed some aspect of the function of the patella in knee extension were reviewed, and many reported results following patellectomy. The total number of authors was found to be divided roughly into two categories: thirty-seven stated the patella serves a definite purpose in knee function, while twenty-seven indicated that the patella has little use and its loss is not important to function. A few authors from each group are cited here.

In 1827, the Bell brothers wrote that the patella acts as a pulley, thus increasing the leverage of the quadriceps femoris. Heineck in 1909 found that the removal of the patella is followed by a weakening of the quadriceps femoris. As a result of his studies on the evolution of the knee joint, Hertzmark in 1937 concluded that the thickness of the patella in man carries the patellar tendon more anteriorly and thereby increases the tension of the quadriceps femoris. Berkheiser made studies of patellectomies for arthritic knees in 1939; he found that the patella enhances quadriceps femoris power. In 1945, Haxton carried out dynamometer tests to determine quadriceps strength following patellectomy. He found that at 60 and 90 degrees extension was stronger without the patella, but at 120 and 150 degrees there was a marked loss of extension power when the patella was absent. West in 1951 found that his patellectomized pa-

Figure 1. Testing position.

tients had either powerful extension but incomplete range, or complete extension with fair power.

Contrary to the above opinions, Scudder in 1898 reported on a total and partial patellectomy he had performed on a forty-four-year-old male for bilateral fractured patellae. He concluded that the knee is functionally as strong without a patella as it is with that bone. Doing more work on this problem than had yet been undertaken, Brooke, in 1936 and 1937, came to the conclusion that the presence of the patella is due to phylogeny, and it is not developed in the tendon of the quadriceps femoris muscle. He found that his patellectomized patients had stronger knee extension on the operated side as compared with the nonoperated side. Blodgett and Fairchild in 1936 considered the patella as a guide to the extensor action, but said that its removal would produce no serious consequences. Dobbie and Ryerson performed twenty-one patellar excisions between 1937 and 1941. They found from dynamometer tests of the quadriceps femoris that the power of extension was impaired and, in some cases, the operated knee was three to eight pounds stronger. Bruce and Walmsley in 1942 performed patellectomies on rabbits and observed how each used the operated leg. They concluded that the patella acts only as a protective bone.

The objective of this research was to investigate the strength of the quadriceps femoris muscle at certain degrees of knee extension following a patellectomy, and to compare these strength values with those of the contralateral nonoperated extremity. Nine adult subjects with unilateral patellectomies were tested, three females and six males, with ages ranging from thirty-two to seventy years. Patellectomies had been performed on the right side in four subjects and on the left side in the remaining number.

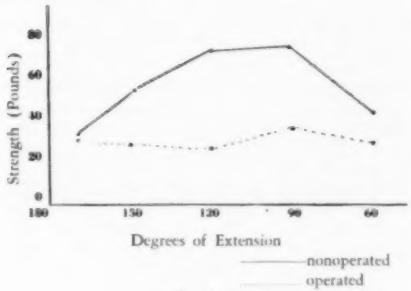
Circumference measurements were taken 5 and 7 inches above the base of the patella of the nonoperated leg and the distance from these points to the medial malleolus was measured. Corresponding distances on the operated extremity from the medial malleolus to the thigh were measured and circumferences recorded. The range of active flexion and extension was measured in the sitting position, and a check of extension was made with the subject in a supine position, legs over the edge of the table to eliminate hamstring tension. In this study, complete extension is considered as 180 degrees, with flexion moving toward zero degrees (Robinson).

Strength measurements were made by means of an electronic instrument developed by Dr. Willis C. Beasley, United States Public Health Service, Bethesda, Maryland. For the measurement of muscle force and "partial weight" of the leg, the subject was placed in a sitting position, with the legs over the edge of the table. He leaned backward, with his arms behind him, hands gripping the sides of the table (Clark). An inclined plane was placed behind him for support and pelvic stabilization. Hip flexion was maintained at 130 degrees. For further stabilization, a strap was placed over the anterior superior iliac crests and fastened to buckles which were secured beneath the surface of the table. A folded towel, 1½ inches thick, was placed under the thigh of the side being tested *(see Figure 1.)*.

With the subject in position, muscle strength tests were made with the knee at 170, 150, 120, 90, and 60 degrees. The test resistance was applied cephalad to, and midway between, the lateral and medial malleoli. The direction of the resistance force was maintained at all times at a right angle to the long axis of the leg. Three maximum contractions were performed at each of the five angles and a mean of these was taken as the final strength figure. Four subjects began their strength tests at 170 degrees and five at 60 degrees to vary the element of fatigue.

With the subject in the same position, "partial" leg weights were measured for correction of the strength readings. That is, the weight of the rest-

ing leg was measured at 170, 150, 120 and 60 degrees of knee extension. The first three values were added to the corresponding strength figure, while that at 60 degrees was subtracted. Leg weights were recorded with the gauge of the testing instrument at the same level on the leg (cephalad to the malleoli) as that used for strength measurements.



Graph 1.

Results and Analysis of Data

Graph 1 shows the mean curve of extensor strength of the nine subjects for the operated and nonoperated extremities. Study of the individual curves indicated that the normal extremity of a majority of subjects followed the general pattern of the mean curve, all having the greatest strength at 90 or 120 degrees (six at 90 degrees, and three at 120 degrees). The extremes of the curves showed the least strength, six cases being lowest at 170 degrees and three at 60 degrees. In all subjects tested, the nonoperated leg was stronger in total knee extensor force than was the operated leg.

On the operated side, the curves in each case are flatter than those for the normal, although the peak of the mean curve for both the operated and nonoperated extremities is at 90 degrees. With two exceptions, as was true for the normal leg, the greatest strength of the operated extremity was found at 90 or 120 degrees (four at 90 degrees, two at 120 degrees, and in one case the points were equal in strength). One subject was found to have the most strength at 60 degrees, and another at 170 degrees.

Table I shows strength differences in pounds between the operated and the nonoperated extremities. The operated leg was stronger in only three of the forty-four points tested—in two instances at 170 degrees of extension.

TABLE I

Strength Differences Between Operated and Nonoperated Extremities (Pounds) (Operated Greater than Nonoperated by Amount Shown)

Cases	Degrees of Extension				
	170	150	120	90	60
I	3.6	43.6	61.4	52.0	27.2
II	4.0	44.1	39.5	51.0	31.9
III	—7.0*	37.2	30.9	14.0	25.0
IV	.5	23.5	59.0	44.0	5.0
V	17.8	20.2	29.2	24.0	26.0
VI	9.0	7.8	31.1	36.0	—1.1*
VII	8.1	8.4	76.3	50.0	17.2
VIII	....	21.8	29.3	20.3	8.0
IX	—1.3*	23.2	54.7	70.0	36.4
MEAN	9.4	25.5	45.7	40.1	22.0

*Indicates operated leg stronger than nonoperated leg.

Five of the nine subjects experienced the greatest amount of extensor power loss as compared with the contralateral extremity at 120 degrees of extension (Cases I, IV, V, VII, VIII), while three of the nine showed the greatest loss at 90 degrees (Cases II, VI, and IX); one subject had the greatest loss of extensor power at 150 degrees of extension (III). It is interesting to note that in seven of the eight cases tested at 170 degrees, this was the point at which the two extremities were most nearly equal in strength. (One subject was unable to exert force at this point.)

A majority of cases demonstrated some degree of atrophy in the thigh of the operated extremity, but the difference in circumference had little relation to the amount of strength difference between the two extremities.

Of the nine subjects tested, all but two could completely extend the leg actively. Four of the nine subjects had greater range of flexion in the operated knee than in the nonoperated. Two subjects had greater knee flexion in the nonoperated extremity, while the remaining three had an equal amount of knee flexion in the operated and nonoperated extremities.

SUMMARY

1. In nine subjects with unilateral patellectomies, the nonoperated leg was stronger in total knee extensor force than the operated extremity.
2. The operated extremity had a relative plateau of strength between 170 and 120 degrees, while the nonoperated leg showed a sharp rise in extensor force between these two points.

3. The greatest mean difference in strength between the operated and nonoperated extremities was at 120 and 90 degrees of extension.
4. The least amount of strength difference between the two sides was found at 170 degrees of extension.
5. There was a decrease in the circumference measurements of the operated extremity as compared with the nonoperated side, but showed no relation to comparative strength.

REFERENCES

1. Bell, John, and Charles: The Anatomy and Physiology of the Human Body, p. 84. New York, Collins & Co., 1827.
2. Berkheiser, E. J.: Excision of the Patella in Arthritis of the Knee Joint. J. Am. Med. Assn., 113:2303-7, 1939.
3. Blodgett, Wm., and Fairchild, Robert: Fractures of the Patella. J. Am. Med. Assn., 106:2122, 1936.
4. Brooke, R.: The Effect of Removal of the Patella for Simple Transverse Fractures on the Function of the Knee-Joint. Proc. of the Royal Soc. Med. 30:203-7, 1936.
5. ———: The Treatment of Fractured Patella by Excision. A Study of Morphology and Function. Brit. J. Surg., 24:733-47, 1937.
6. Bruce, John, and Walmsley, R.: Excision of the Patella. J. Bone and Jt. Surg., 24:311-324, 1942.
7. Clark, H. H.: Testing Muscle Strength. Research Reviews, 1950.
8. ———, *et al:* Relationship Between Body Position and the Application of Muscle Power to Movements of the Joints. Arch. Phys. Med., 31:81-9, 1950.
9. Dobbie, R., and Ryerson, S.: The Treatment of Fractured Patella by Excision. Am. J. Surg., 55:339-370, 1942.
10. Gray, Henry: Anatomy of the Human Body. Pp. 230, 325, 471. Philadelphia, Lea and Febiger, 1948.
11. Hanton, H.: The Function of the Patella and the Effects of Its Excision. Surg., Gyn., and Obst., 64:1074-8, 1937.
12. Heineck, A. P.: The Modern Operative Treatment of Fractures of the Patella. Surg., Gyn., and Obst., 9:177-248, 1902.
13. Hertzmark, M.: The Evolution of the Knee Joint. J. Bone and Jt. Surg., 20:77-94, 1938.
14. Morris Human Anatomy, Schaeffer, J. P. (Editor). Philadelphia, The Blakiston Co., 1942.
15. Robinson, Wilton: Joint Range. J. Orth. Surg. 3:41-51, 1921.
16. Scudder, Charles: Comminuted Fractures of Each Patella. Boston Med. and Surg. J., 138:231, 1898.
17. Spaltcholz, W.: Hand-Atlas of Human Anatomy, p. 354. Philadelphia, J. B. Lippincott Co., N. D.
18. West, Francis: Knees. Progressive Resistance Exercises. DeLorme, T., and Watkins, A. L.: P. 135. New York, Appleton-Century Crofts, Inc., 1951.

Meet Our New Contributors

Martin Avignon, Jr., physical therapist in the Department of Physical Medicine and Rehabilitation at Gallinger Municipal Hospital, Washington, D. C., was graduated from Georgetown University, Washington, D. C., with a B.S. degree. Later he did graduate study in the basic sciences at the University of Iowa, Iowa City.

Mr. Avignon received his physical therapy training at the Medical College of Virginia. He is a member of the American Physical Therapy Association and of the American Registry of Physical Therapists.

Miriam Avignon, physical therapist in the Department of Physical Medicine and Rehabilitation at Gallinger Municipal Hospital, Washington, D. C., received her B.A. degree from Hunter College in New York City, and did graduate work in bacteriology and clinical pathology at the Post Graduate Medical School and Hospital in the same city.

Mrs. Avignon had her physical therapy training at the Medical College of Virginia. She is a member of the American Physical Therapy Association and of the American Registry of Physical Therapists.

Jessica A. Hopkins, Supervisor of Physical Therapy at the Cleveland Rehabilitation Center, received her B.A. degree from Western Reserve University.

She completed her preparation in physical therapy at the Cleveland Clinic in 1943, and entered the U. S. Army a year later.

Miss Hopkins is a member of the American Physical Therapy Association and the American Registry of Physical Therapists.

Betty Lee Katz, who recently received her master's degree from Stanford University, began her college work at the University of Wisconsin in 1938, and later matriculated at West Virginia University where she was graduated in 1942 with a B.S. degree. She received her certificate in physical therapy from the Mayo Clinic the following year.

Miss Katz served in the U. S. Army as Chief Physical Therapist with the 191st General Headquarters in Paris, and at the Aberdeen Proving Grounds in Maryland.

For four years Miss Katz was with the Veterans Administration in Los Angeles, and assisted with the clinical training of physical therapy students from Children's Hospital and the University of Southern California.

Miss Katz is chairman of Public Relations and Publicity Committee of the Southern California Chapter of the American Physical Therapy Association.

Advanced Skills for the Bilateral Above-Knee Amputee

Jessica A. Hopkins, B.A.

Few physical therapists have the opportunity to acquire a great deal of experience in the training of bilateral above-knee amputees. While the mechanics of walking on an artificial limb is fundamentally the same as for a single above-knee amputee, the absence of a dynamic knee joint in either lower extremity creates special problems. The therapist who is working with a bilateral above-knee amputee for the first time and who may have had no opportunity for intensive observation of an accomplished performer may find it difficult to envision adequate technics for meeting all the situations that will arise if the amputee is to be completely independent in traveling activities. When the fundamentals of weight-bearing and step-making have been mastered and the amputee has become ambulatory on level surfaces in a sheltered environment he will undoubtedly take great pride in this achievement. Actually, however, from a practical standpoint he will not have enlarged his sphere of activity in the slightest degree. At this stage of accomplishment his locomotion is only a more difficult way of performing activities that might readily be carried out in a wheel chair. If his walking is to have a true practical value additional training in advanced skills will be required.

Our experience at the Cleveland Rehabilitation Center has been largely with amputees of middle age whose amputations have followed vascular insufficiency due to arterial disease or remote frostbite. On the whole they are apt to be somewhat apprehensive and cautious in attempting new activities. Patients in this older age group do not usually experiment sufficiently to learn much by themselves on a trial and error basis. It therefore devolves upon the therapist to suggest specific technics.

The technics presented here were evolved by simple deduction based on fundamental mechanics. They were then tried out in actual practice and found to be feasible. It is not, however, reasonable to expect every bilateral above-knee amputee to master all of the skills presented here. Realistic goals will have to be set for each amputee on an individual basis in accordance with fundamental motor ability and degree of motivation.

The skills described below were all executed on bilateral conventional or bilateral suction socket prostheses with standard knee hinges. We have had no experience with the knee locks that are sometimes used when a bilateral above-knee amputee begins walking training. Since for these patients control of the knee joint is of prime importance in any activity that they may undertake we prefer to leave the knee hinges freely mobile so that the amputee may learn knee control during the initial weight-bearing training.

We have not had enough experience with bilateral suction sockets to draw any valid conclusions as to their relative merits. Two patients so fitted are in training at present. We have found that the use of two suction sockets is entirely feasible, but that these prostheses require very frequent revision since the rapid girth changes that always occur, when an amputee first starts to use a prosthesis, cannot be compensated for by a change in stump socks. Furthermore, with a suction socket the initial period of stump shrinkage is commonly followed later on by a period in which the stump increases in girth due to muscular hypertrophy. A relatively long period of time must therefore elapse before stump size can be expected to remain fairly constant. It remains to be seen whether later advantages of the suction type prosthesis will offset these initial difficulties. During the early training period little or no difference in performance has been noted and frequent interruption of the training program due to the need for prosthetic revision has been a hindrance.

Incidentally, it might be mentioned here that our patients have experienced no difficulty in applying two suction type prostheses. The prostheses are applied in a long-sitting position and remain in place satisfactorily without suction until the transfer to a weight-bearing position is made.

Supervisor of Physical Therapy, the Cleveland Rehabilitation Center, Cleveland, Ohio.

Figure 1. Rising from a chair using two canes.

Reduced hand support

We feel that it is practical and desirable for the bilateral above-knee amputee to use two canes in most ambulation activities. Use of one cane alone gives a very small margin of security to even a skillful walker. Furthermore, it makes elevation without a handrail or other stationary support virtually impossible, thus preventing independent ambulation in outdoor situations where curbs must be traversed. Nevertheless, practice with one cane is important to prepare the amputee for everyday activities such as the following: (1) reaching into pockets while standing, (2) manipulation of door knobs, (3) toilet activities, (4) removal of outer clothing.

The bilateral above-knee amputee should be able to achieve momentary standing balance without any hand support. Flexion contractures at the hips will make unsupported standing difficult by throwing the center of gravity too far forward of the hip joints. Minimal flexion contractures can be adequately compensated for by a mild lumbar lordosis without serious impairment of balance. Standing and walking in a protected situation without hand support is excellent training for improved balance. It will make walking with two canes far more secure and relaxed.

Rising from chair

The safest way of rising from a chair is, of course, with a half turn, as generally practiced by patients with bilateral long leg braces. In this method the prostheses can both be fully extended before stable support from the chair itself is relinquished. It is a good method but slow and awkward in appearance.

Eventually most of these amputees should be able to rise from a chair straight forward, taking support from two canes alone. *(See Figure 1.)*

Essentials of this maneuver may be accomplished as follows:

(1) Slide forward on the chair sufficiently to have both feet in firm contact with the floor.

(2) Place both canes behind the line of the two feet in a position to get pure "push" and not "pull" against the canes. Only in this way can adequate lifting power be secured.

(3) Perform the movement as rapidly as possible, using the momentum of the trunk, first well forward then sharply upward. Hesitant attempts at this maneuver make it appear hopelessly difficult.

Sitting down is accomplished as the reverse movement and is easily done. Usually placing one cane well behind at the side of the chair is sufficient to brake the descent.

Ascending steps

Stairs with a handrail do not present much of an obstacle to a bilateral above-knee amputee with good power in the upper extremities. Frequently a person favors one leg for purposes of elevation. It is wise to insist that elevation be practiced on alternate sides. Otherwise the trainee will eventually show a marked deficiency in muscle strength on the less used side. Generally, also, the handrail will be used for pulling rather than pushing and special practice will have to be instituted in using a downward pressure on the railing so that the walker will not be stranded on top steps where the railing ends.

Figure 2. Ascent with two canes.

On the other hand, elevation onto a step with no fixed handhold available is a very difficult feat but one which must be mastered if the amputee is to travel freely on the street and enter public buildings and private dwellings not specially designed for handicapped persons. Fortunately curbs and outside steps are usually lower and deeper than a standard stair tread. Few bilateral above-knee amputees will be able to climb a long flight of stairs without a rail but most of them should be able to do at least single low steps.

Figure 2 shows the proper starting position for elevation on two canes. Canes are placed directly opposite the contralateral foot. When rising from this position the amputee is well protected against loss of balance forward, backward, or to either side. The most critical stage of the maneuver comes at the completion of the body lift. At this point the body weight is far forward and there will be a tendency to fall forward. A rapid shift of the hind cane forward onto the step is required at this point and since most of the impetus is derived from this cane the shift must be timed exactly to coincide with the moment when the center of gravity begins to fall in front of the feet. Initial practice is best carried out with some fixed support available in front, yet far enough away so as not to interfere with the sharp forward flexion of the trunk required in taking cane support from a level lower than the feet. The practice step should be wide and broad and adjustable to increasing elevations.

Descending steps

Theoretically the amputee should be able to exercise control over a partially flexed prosthetic knee joint as long as the upper body is fixed in the anteroposterior plane, usually by accessory hand support. To exert an active extensory force at the knee, two conditions must be fulfilled:

(1) The foot must be fixed, usually by firm contact with the floor.

(2) A rotatory force, as contrasted with a translatory force, must be exerted against the thigh segment of the prosthesis. This means that backward pressure at the end of the stump is effective only as long as the upper end of the socket is either stationary or moving forward.

To understand this latter requirement the physical therapist needs only to manipulate a prosthesis in the following way: backward pressure exerted by the right hand simulating extension of the stump serves only to increase knee flexion, except as the left hand either stabilizes or thrusts forward against the rim of the prosthesis. From this it may easily be deduced that a controlled descent will prove far more difficult than elevation. On ascending stairs a rotatory force against the thigh segment is more easily developed since the momentum of the action supplies the required forward pressure against the rim of the prosthesis. During descent, however, no forward-upward momentum can be developed to offset the effect of gravity.

Furthermore, there are other factors operating against a well controlled descent which must be considered. Since the knee hinge is placed posteriorly, controlled flexion of the fully extended knee requires in rapid succession a brief movement of active hip flexion to initiate knee flexion, followed immediately by full contraction of the hip extensors to act as a braking mechanism. This braking maneuver might be more easily accomplished if the body weight could be brought forward of the knee hinge to aid extension, but in this situation a shift of weight forward would be extremely hazardous. Safety requires that the center of gravity be kept well back so that in case of any mishap the fall will be backward rather than forward.

All in all, the problem of mastering a controlled knee bend, although theoretically possible, is in practice extremely difficult. Here at the Center we have yet to find an amputee who can learn to do it. The "giving away" of the knee is actually not too dangerous to the patient if he is using a handrail but even then the amputee who is at all apprehensive will prefer to make a quarter turn toward the rail in order to keep the supporting limb locked at the knee during the step down. Certainly this latter method as illustrated in Figure 3 is the method of choice in any situation where support must be taken from canes alone. To start this maneuver both canes are advanced to a lower level, well separated to provide a wide base of support. One foot is then advanced and gradually lowered while executing a quarter turn of the body toward the opposite side. The supporting knee is thus securely locked in extension throughout the descent and the descent is easily controlled from the hip. The only disadvantage of this technic of descent, aside from a somewhat awkward appearance, is that a wide space is required for its execution. A standard home stairway is barely wide enough for this maneuver and since there is apt to be some sideward displacement of the lead foot at each step, an intermediate sidestep to regain proper position for the next descent frequently may be required.

Figure 3. Descent with two canes.

Falls

Controlled falling is usually easy for the bilateral above-knee amputee. Falls are taken straight forward onto both hands. In this position the prosthetic knees are stable in extension. The fall is completed by turning onto one hip, finishing in a long-sitting position. In preparation for the complete fall the amputee should practice discarding the canes and flexing the trunk forward to hand support at chair seat level. The height of the hand support is gradually decreased by using stools of different heights until the amputee is ready to bend all the way down to touch the floor. In order to return to the upright position from a position of extreme forward flexion the canes should be recovered and used to elevate hand support on one side. Since leg length is commonly decreased by as much as two to four inches in constructing prostheses for bilateral amputees the quadruped position is usually easy to attain and yields a long anteroposterior base of support.

Inadvertent falls generally occur when one knee gives way suddenly, throwing the center of gravity over the collapsed prosthesis. Preliminary practice in forward flexion of the trunk will provide the amputee with an automatic mechanism that will facilitate recovery of balance or, failing this, position him properly for a safe, easy fall.

Elevation from the floor

Getting up from the floor using canes alone might seem to be an almost impossible feat for the bilateral above-knee amputee. Actually it can be performed very easily and quickly once a simple "trick," essential to the maneuver, is mastered.

In exploring possible means of getting up from the floor the bilateral amputee will usually attempt to rise from hands and knees. This can be accomplished by: (1) abducting and extending one prosthesis and fixing it in extension by catching the forepart of the sole of the shoe against the floor; (2) extending the second prosthesis in a similar fashion; (3) walking forward until the feet are under the hips; (4) extending the trunk on the prostheses with the help of the canes, thus regaining an upright position. This method is slow, laborious, and somewhat uncertain because of the ever-present threat of having the foot slide along the floor during steps 1 and 2.

The preferred method of rising from the floor is illustrated in Figures 4 and 5. It is started from

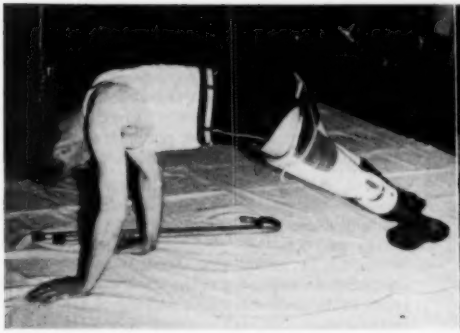


Figure 4. The roll. Note that left toe has been caught to maintain extension.

Figure 5. Recovery of canes.

a long-sitting position. From this position a quick half roll is executed onto hands and feet with the hips well elevated. It is essential that the inside, or pivot, prosthesis be kept fully extended during the roll. Extension is maintained by catching the sole of the shoe firmly against the floor as the roll is executed. The greater the angle of hip flexion maintained during the turn the more securely the inside foot comes to rest against the floor. If sufficient hip flexion is maintained during the turn the amputee is ready to come directly to a standing position as soon as the canes are recovered. Canes are generally placed parallel to the body at about the level of the hips before the roll is started. They are then readily available between the two hands after the roll is completed. This entire procedure of elevation from the floor to the upright position can be completed in a few seconds.

Ramps

Walking up an incline presents little difficulty to the bilateral above-knee amputee who has learned to walk on level surfaces. Standing on an upgrade forces the knee hinge posterior to the gravital line, reinforcing knee extension. Descending a ramp, however, has the opposite effect of throwing the shin forward, making it very difficult to maintain knee extension. Theoretically the amputee should be able to place the feet solidly on a down slope, compensating for the forward inclination of the prostheses by hyperextension in the lumbar area. Obviously, though, this would require very powerful hip extension toward the limit of the full range of motion. Even a gentle ten degree decline means, with some variation according to the length of the prostheses, about a seven inch forward displacement at hip level since no accommodation can be made at the ankle joint. A further forward excursion would be required in making a step. Even with maximum counterbalance by hyperextension of the trunk this brings the weight almost entirely on the hands, the position being extremely precarious. All considered, it is probably preferable for the amputee to retain normal postural alignment, with the hips directly above the ankle joints, even though this means that the heels alone will contact the floor. There will be a strong tendency for the prostheses to rotate but this can be reasonably well controlled. Since the hand support is lowered there will be an increase of flexion at the hips which brings the joint well within its power range.

Outdoor ambulation

The physical therapist who has never participated in the training of a bilateral above-knee amputee will probably not anticipate the numerous hazards that are certain to be encountered in walking along an ordinary sidewalk. Even though surfaces are level, variations in surface friction are of marked significance to the amputee. Stone sidewalks and some cement walks present an optimum degree of friction. On the other hand, smooth cement and highly glazed brick may be as treacherous as ice. A rough surfaced cement may present such a high friction component as to prevent the small rotations of the supporting prosthesis which amputees habitually use on ordinary floor surfaces. Experience of these minor variations of surface texture prepares the amputee for walking on gravel, grass and other rough ground.

In traveling on ordinary city sidewalks there

are, in addition to variable surface textures, continual changes of level and pitch. The amputee must learn to take minor height changes without breaking his stride. Changes of three or more inches will probably require special measures as outlined in the sections on ascending and descending steps.

Inclines are constantly encountered in daily travel. Training in ascending and descending ramps will help to prepare for these, but side stepping up and down an incline facing alternate directions also should be practiced to familiarize the amputee with lateral inclines. These are frequently encountered, and it should be remembered in approaching this problem of rough ground that a tilt of one quarter inch at the heel is transmitted as an excursion of approximately four inches at the hip.

Wind is a hazard that will be encountered only out-of-doors and no amount of indoor practice can prepare the amputee to adapt his gait to its vagaries. Even a light breeze can be disturbing, not only as a threat to balance but also as interference with the normal swing of the leg. A strong breeze may make it very difficult to swing the foot through to complete the step.

Outdoor time and distance trials should be held to develop speed and endurance. Special practice in crossing busy thoroughfares within the time allotted by traffic lights should be given. On wide streets or where the timing of green lights is short the amputee may find it necessary to step off the curb and then await the green light. Maximum performance among our patients in travel on city streets was a trip of three-fifths of a mile in a commercial area of the city over rough, highly variable sidewalks. One-and-a-quarter hours were required to travel this distance. This constitutes a very long period of continuous weight-bearing for a bilateral amputee.

Case summaries

It would be unreasonable to expect all bilateral above-knee amputees to learn all of the skills that have been described here. A brief survey of the patients who have been seen here at the Cleveland Rehabilitation Center over the past few years will serve to illustrate individual differences. In all cases the level of performance on discharge had to be accepted as optimal, either because the individual failed to show further functional gains on extension of the training period, or because the patient showed no interest in further accomplishment.

Case 1. A 45-year-old male: History of arteriosclerotic gangrene. Ambulatory on two canes on admission to the Center, having had training elsewhere. Transferred here to work in our sheltered shop while continuing walking training. Total training period eighteen months, prolonged because of interruption to replace sockets. Balance excellent. Minimal support from two canes. Could negotiate curbs, ramps, stairs. Completely independent except for use of public transportation. Standing tolerance up to one hour.

Case 2. A 51-year-old male: History of peripheral vascular disease. Preparatory exercises for two months while prostheses were being constructed. Level of optimum performance reached after seven months of training. Walked on two canes. Negotiated ramps and railed stairways. Endurance poor: 100 yards maximum walking distance. Unsafe in negotiating curbs alone. Skill adequate for requirements of a permanent ambulatory nursing home existence.

Case 3. A 66-year-old male: History of diabetic gangrene. Generalized arteriosclerosis with hypertension. Cardiac classification IIC. One month's trial period of conditioning exercises with subsequent conditional approval by cardiologist for training with prostheses. Eleven months of walking training. Activity limited by poor cardiac reserve. Walking 100 yards caused marked dyspnea. Walked on level with two canes. Could climb ramps and steps within cardiac limitations. Is having short pylons made for daily use at home.

Case 4. An 81-year-old male: History of diabetic gangrene. Cardiac classification IIB. Two months' supervised exercise for general conditioning and correction of flexion contractures. Secured short pylons. Fitted with crutches. Practiced satisfactorily on his own after only one period of professional instruction. After two months was able to go outside, walk on sidewalks, and work in his garden.

Case 5. A 59-year-old male: History of severe frostbite at age 25. Amputations at age 55. Homebound because of necessity of caring for wife in terminal cancer. Some practice on prostheses during this period with minimal instruction furnished by the Cleveland Rehabilitation Center home service. Ambulatory on two canes on admission to the Center at age 57. Twenty-four months of training, one or two periods a week, because of interest in acquiring all advanced skills. Standing tolerance over two hours. All skills. Does all own housework from low cart. Uses short pylons for outdoor work: mowing lawn, etc. Self employed in home workshop. Uses conventional prostheses for "dress-up" occasions. Does not use local public transportation but has traveled alone on trains, planes and busses.

A Passive Exerciser, Used Actively

Harold D. Storms, M.D.

In a department dealing with disabilities resulting from trauma, stiff joints are part of the daily program. In my experience, of these stiff joints, elbows and knees are often the most recalcitrant; and of these two, the knees, because of the heaviness of the structures and the powerful muscles involved, are the more difficult to treat successfully.

If a knee is stiff in extension, and lacks flexion, it may be due to one of the following causes:—

a. The leg has been in a whole-leg cast and the knee has stiffened from disuse.
b. Following meniscectomy, movement has not been kept up and the knee has been allowed to stiffen.
c. Due to joint sprain, with or without effusion, knee movement has not been maintained because of pain.
d. Fractured patella.
e. Fractures about the knee.
f. Laceration of extensor apparatus.
g. Burns and skin lesions.
h. Some forms of arthritis.

If the knee is stiff in flexion and lacks extension it may be from one of the following common causes:—

a. Result of traction pins.
b. Following meniscectomy where knee has been allowed to rest on a pillow.
c. Some forms of arthritis.

The knee is a joint moved by some of the strongest muscles in the body, and whether the stiffness be due to muscle shortening, adhesions about ligaments, or intra-articular change, efforts to move the joint passively need to be very strong and frequently are beyond the strength of a physical therapist. Passive movement is a necessary part of the treatment because it is difficult for the patient to actively move the stiff joint. Even if he can stand the severe pain, leverage is lacking to exert force in the proper place.

Passive movement to be effective and not destructive requires the following factors:—

1. Rigidly metered force so that a definite graduation is possible, yet at no time sufficient to cause a joint reaction.
2. Carefully measured excursion of movement so that progression will be ordered and gradual, avoiding an unevenness that would put unexpected strain on tissues not yet ready to stand it.
3. Conditions which will assure the patient that factors 1 and 2 will be maintained so that relaxation of all tissues will be permitted. With apprehension abolished there will be cooperation and not obstruction.

The apparatus to be described fulfills these conditions. It provides passive movement of the joint done by the patient. Two years experience with it has demonstrated that it can be considered a definite step in the shortening of disability time resulting from stiff knees. For want of a better name we call it the "Knee Bender."

The photographs show how all the effort is provided by the patient. Because there is no fear of passive violence he can relax his muscles. The leverage exerts the pull on the stiff or shortened tissue, with body weight providing the motive power.

The seat is adjusted in height according to the degree of flexion limitation. The effort to sit on it puts only a mild strain on the stiff joint; secondly, but not so in importance, is the distance the buttocks have to descend to sit on the seat. It must be not so far down that it appears impossible, and discourages the patient from trying to do it.

After sitting and rising many times until it can be done easily, the seat is lowered another small distance, and so on until, as in the photograph, the patient has enough knee flexion for work.

The results from this apparatus depend, of course, on the care with which it is used. Our technic is for the physical therapist to carefully explain to the patient the principle of the machine, and to point out that all effort and movement are under the sole control of the patient—that he is not expected to torture himself, but little by little, and at his own speed, to use the apparatus

Director of Physical Medicine and Rehabilitation, State Insurance Fund, San Juan, Puerto Rico.

Figure 1.

Figure 2.

to treat himself. I feel sure that knowing that with his hands on the grips he can control the strain and movement to fit his endurance, there is a psychological effect which has much to do with the good results obtained.

It will be noted that the smooth round bar behind the knees is adjustable in height; and that the stirrup to prevent forward movement of the feet is fixed.

In my experience stiffness in flexion is not so common and can more easily be corrected by ordinary treatment. If it be necessary to use the apparatus for this, the procedure is to have the patient face the machine with the bar touching the shin just below the knee joint, and with his heels fixed by the stirrup, pull himself forward by the handgrips.

From our experience in Puerto Rico we expect the average case of stiff knee to improve in movement at the rate of a one inch lowering of the seat every one to three days.

It is understood, of course, that this machine's use is only one part of the treatment that the patient is receiving, and that also, careful check is kept on the knee to note any signs of joint reaction, prohibitive of further immediate passive movement.

It is not necessary to point out that one does not use this method in the presence of joint disease or active noninfective inflammation.

Acknowledgment is made of the work done by Doctor Bruce H. Young, present superintendent of Malton Convalescent Centre, Canada, who elaborated this apparatus from the rough idea of the principle I gave him.

Extension Contracture of the Knee Joint

Use of a pulsating current in stretching a painful and resistant contracture following a patella fracture

Miriam Avignon, B.A.,
and Martin Avignon, Jr., B.S.

In January, 1944, the Baruch Committee on Physical Medicine emphasized that one of the chief needs for the development of Physical Medicine was more extensive basic and clinical research. Though the committee no longer exists, it is that thought which prompted the presentation of this paper. It is hoped that it will stimulate research in the use of pulsating current in minimizing pain during the stretching of extension contractures of the knee joint following patellar fractures.

REPORT OF A CASE

Mr. X, a 45-year-old white male, was admitted to an out-of-state hospital on March 11, 1951, after having been in an automobile accident. His diagnosis on admission was "comminuted fracture of the right patella with multiple lacerations and abrasions." On March 13, surgery was performed. It was noted that wide separation between the patella fragments existed. At this time the fragments were wired and a circular cast was applied from the toes to the upper thigh.

The patient's postoperative course in the hospital was uneventful. He was advised about quadriceps exercises while still in the cast, but received no actual physical therapy. When the cast was removed March 27, the patient was urged to start active and passive movements of the knee joint, but again was not treated by a physical therapist. Some muscle atrophy was already noticeable, and it was thought that the patient had not been performing the suggested quadriceps exercises. After removal of the cast and throughout his entire hospital stay, he was extremely apprehensive with respect to any motion of the knee joint. (The preceding information was obtained through correspondence with the attending physician.)

On April 20, Mr. X was referred to the Department of Physical Medicine and Rehabilitation of Gallinger Municipal Hospital. He was walking with crutches using a three point gait. A muscle test revealed fair minus quadriceps and hamstrings. Joint range measurements disclosed 15 degrees active and passive flexion with complete extension. During the initial examination, which was performed by Dr. Josephine Buchanan, physiatrist at this hospital, it was apparent that the patient was still reluctant to flex his knee.

Prescribed treatment was instituted twice daily consisting of infra-red to the anterior surface of the right thigh, and sedative massage to the entire right leg; this was followed by active exercises to the quadriceps and hamstring muscles, progressing to active resistive exercises as strength of these muscles increased. Upon completion of the exercises, very gentle passive stretching was performed in the usual manner in an effort to increase the range of motion. It was believed that the knee extensor group would be more fatigued at this point and hence possibly more yielding to stretch.

Knee flexion had increased from 15 degrees to 40 degrees by May 3, after 26 treatments, accompanied by considerable pain. Quadriceps and hamstring muscle groups were now fair plus in strength. Further passive motion was contraindicated due to the patient's very low pain threshold. An orthopedic consultation at this time revealed that neither surgery nor manipulation under anaesthesia was indicated.

On May 14, after 14 additional treatments, the strength of the flexors and extensors of the knee joint was good minus, although the range remained 40 degrees; hence, a status quo had been reached and there was no further improvement in range. The patient was now ambulant with the aid of one cane.

The maximum force in stretching which the patient's pain tolerance allowed was only two pounds. As the pain appeared to be concentrated in the area of the suprapatellar pouch, it was thought that electrical stimulation and infra-red applied to this area might be of value in alleviating the pain. This had been suggested by a lecture on the "percussion unit," a thumping device used with some success on the end of amputation stumps for increasingly long periods of time in an attempt to relieve phantom pain.* It was postulated that a pulsating current might simulate the thumping of a percussion unit. It was hoped that it could be made to predominate over the pain sensation; thus, permitting more force to be used in stretching, it would aid in achieving the objective—a functional knee joint.

After discussing this procedure with Dr. Buchanan we obtained her consent to use this technic. The current employed consisted of an alternating current of short duration superimposed on a ½ rectified 60 cycle sine wave. Pulsations were approximately one per second at 1000 cycles. The current was derived from a Medcotronic unit.

The patient was made comfortable in a semisupine position, supported by three pillows. The hips were stabilized; the leg flexed at the knee and permitted to hang over the edge of the plinth. Two pads, 2½ inches by 2½ inches, were moistened and placed over the suprapatellar pouch. A DeLorme boot with a dumbbell handle was attached to the patient's shoe. A luminous infra-red lamp was directed on the anterior surface of the thigh. As the patient's discomfort increased due to the addition of weight to the boot, the milliamperage of the pulsating current was increased. Simultaneously with decrease of discomfort due to increased intensity of the current, weight was added to the boot. This procedure was continued to the limit of the patient's tolerance. The absence of a milliammeter on the Medcotronic unit precluded any intensity reading.

During the first treatment the pain tolerance was increased so that 11 pounds could be sustained. Knee flexion increased from 40 to 45 degrees.

One week or six treatments later, the patient was able to tolerate a force of 16 pounds and his range had increased to 60 degrees. The patient repeatedly stated that

Department of Physical Medicine and Rehabilitation, Gallinger Municipal Hospital, Washington, D. C.

*Ministry of Pension, Limbfitting Service, England, 25th report, April 1, 1949 to March 31, 1950.

during and following these treatments he experienced no undue discomfort and that the pulsating current actually made the treatment quite pleasant. At this point, the patient left the city and treatment was discontinued.

SUMMARY

The results from this application of an unusual technic proved gratifying, and can be summed up as follows:

1) When electrical stimulation was used in conjunction with the stretching of an extension contracture of the knee joint, following a patella fracture, more force could be employed with less discomfort resulting. In only seven treatments maximum force was comfortably increased from two to 16 degrees.
2) Following the first treatment, knee flexion was increased from 40 to 45 degrees.
3) There was an increase in range of knee flexion to 65 degrees following six treatments, as compared to no improvement during the preceding 26 conventional treatments.

It is the opinion of the authors that had it been possible to continue this treatment the patient might have received greater benefits. The treatment was instituted to accomplish a specific rehabilitation goal. When conventional procedures failed, a technic was improvised for a particular patient.

In concluding, it may be stated that our initial endeavor to alleviate pain by means of the application of a pulsating current to aid in the stretching of an extension contracture of the knee joint following a patella fracture, suggests that further studies may prove this method to be of value.

Index to Current Literature

Anterior Poliomyelitis

Poliomyelitis in Connecticut—1951. M. E. Rindge, M.D. Connecticut Health Bulletin, State Department of Health, May 1952.

Arthritis and Rheumatism

New Horizons in the Rheumatic Fever Problem. A. E. Hansen, M.D. Southern Medical Journal, May 1952.

Cerebral Palsy

Nature and Recognition of Cerebral Palsy in Infancy. M. A. Perlstein, M.A., M.D., D.P.H., and H. E. Barnett, M.D. Journal of the American Medical Association, April 19, 1952.

General Management of the Cerebral Palsy Problem. Winthrop M. Phelps, M.D. Virginia Medical Monthly, February 1952.

Child Welfare

A Program for Handicapped Children: The Community in Action. Marcia Hays, M.D. California's Health, State Department of Public Health, April 15, 1952.

Industrial Injuries

Adequate Early Treatment of the Injured Worker. A. G. Kammer, M.D. Pennsylvania Medical Journal, April 1952.

Miscellaneous

Toward a Regional Program in Medical Education. W. J. McGlowthlin. Journal of the American Medical Association, May 3, 1952.

Back-pressure Arm-lift Artificial Respiration. Heinz Specht, Ph.D. Public Health Reports, U. S. Public Health Service, April 1952.

Evaluation of the "Breast Self-examination" Film. E. M. Cohart, M.D., and J. K. Hill, Ph.D. American Journal of Public Health, April 1952.

Occupational Therapy

The Role of Occupational Therapy in the Physical Medicine Management of Physical Disabilities. C. D. Shields, M.D., and others. Southern Medical Journal, May 1952.

Orthopedics

Common Orthopedic Problems Which Can Be Managed in the Office of the General Practitioner. H. R. McCarroll, M.D. The West Virginia Medical Journal, February 1952.

Rehabilitation

Rehabilitation of Patients with Deep Burns. J. B. Brown, M.D. Journal of the American Medical Association, April 19, 1952.

Rehabilitation of Hand Function in Rheumatoid Arthritis. D. L. Rose, M.D., and H. W. Kendell, M.D. Journal of the American Medical Association, April 19, 1952.

Rehabilitation of the Tuberculous Patient. A. R. Dawson, M.D., and B. B. Bagby, Jr., M.D. Virginia Medical Monthly, April 1952.

Reprints Available

THE FOLLOWING INFORMATIONAL MATERIAL AND ARTICLES ON PHYSICAL THERAPY ARE AVAILABLE WITHOUT CHARGE:

Available to chapters, interested individuals and prospective students by single copies or in reasonable quantities:

PHYSICAL THERAPY—IS THIS THE DOOR TO YOUR FUTURE?—
An illustrated brochure describing the opportunities for a career in physical therapy.

APPROVED SCHOOLS OF PHYSICAL THERAPY—
A list of schools approved by the Council on Medical Education and Hospitals of the American Medical Association.

SUGGESTIONS FOR PROSPECTIVE STUDENTS—
Outlines the professional course of study for college students preparing for physical therapy. Of value to the high school student who is planning a college program.

EMPLOYMENT OPPORTUNITIES—
A brief analysis of the various types of employment opportunities open to the graduate physical therapist.

QUESTIONS AND ANSWERS—
A concise outline describing physical therapy education and applications.

Available to chapter chairmen, vocational guidance counsellors, libraries and other individuals or groups who wish more information on physical therapy than is offered in the above items:

OUR ASSOCIATION—
An informational booklet on the activities, scope and services of the American Physical Therapy Association.

CODE OF ETHICS—
Ethics for the physical therapist of the American Physical Therapy Association.

PERSONNEL POLICIES FOR QUALIFIED PHYSICAL THERAPISTS—
Suggestions as to salary, hours, vacations etc. by the American Physical Therapy Association.

INFORMATIONAL BRIEFS ON SCHOOLS OF PHYSICAL THERAPY—
Admission requirements, costs of education and pertinent information on all approved schools.

SECTION ON EDUCATION—
A list of postgraduate programs offered by the approved schools and a list of specialized courses for physical therapists.

RECRUITMENT POSTER—
Attractive, colorful, throw-away bulletin board poster to help vocational guidance and recruiting.

JOB OF THE PHYSICAL THERAPIST—
A complete description of what the physical therapist does, where he works and how he functions in the professional field as well as what type of individual he is. (Single copies are free to counsellors, libraries and chapters; additional single copies 50c each, 10-25 copies 35c each, 25 or more copies 25c each.)

U. S. ARMY, U. S. AIR FORCE AND VETERANS ADMINISTRATION PAMPHLETS—
Separate folders listing education, employment or service opportunities in each organization.

MEMBERS, STUDENT MEMBERS OF THE ASSOCIATION AND LIBRARIES MAY HAVE ONE FREE COPY OF EACH SCIENTIFIC REPRINT FOR WHICH THERE IS A CHARGE EXCEPT THE SPECIAL ISSUES OF THE REVIEW AND OTHER SPECIAL MATERIALS FOR WHICH A FEE MUST BE CHARGED:

Scientific Reprints

PHYSICAL THERAPY IN MEDICAL DISEASES OF THE CHEST—*Evelyn A. May* (10c)

PHYSICAL THERAPY IN THE EARLY CARE OF COLD INJURIES—*Mary E. Sacksteder, Capt., WMSC* (10c)

TOYS, GAMES AND APPARATUS FOR CHILDREN WITH CEREBRAL PALSY—*Gladys G. Rogers and Leah Thomas* (10c)

ADMINISTRATION OF A COMMUNITY REHABILITATION CENTER—*Hazel E. Furscott* (10c)

WHEEL CHAIRS—*George G. Deaver, M.D.* (5c)

PHYSICAL THERAPY IN THE PRENATAL PROGRAM—*Gillian Griffith Smith* (5c)

ROLE OF PHYSICAL THERAPY IN CARE OF PSYCHIATRIC PATIENTS—*Lola E. Smith* (5c)

(Continued on page 421)

Editorials

TECHNIC: *The method on the details of procedure essential to expertness of execution in any art or science: hence, manner of performance.*

The above quotation from Webster's Dictionary concerns a word, which in our profession is used as often as almost any other. This is a word which each of us met during our earliest training days and which has undoubtedly continued to grow in meaning and concept with each passing year. We use it over and over again in writing, talking, and thinking, but how often do we use its definition as a yardstick for evaluation of our efficiency and success and how frequently do we criticize our own technic as to its competence and excellence.

For example, let us consider one part of the definition which states *details of procedure essential to expertness*. These few words contain an excellent standard against which each of us might well measure our performance. Do we give sufficient attention to the details of procedure to insure a return of optimum results or has our "technic" lost its expertness and become a mere ritual done in a specific time?

Physical therapists as students and recent graduates tend to be markedly conscious of the particulars of treatment procedures to a great extent because of inexperience and a more narrow field of understanding. With experience, however, there sometimes comes a tendency to habitually perform a routine to the point where some of the refinements are lost. This situation can result in a performance of treatment procedures somewhat lacking in thought and attention to objectives, which is best described as "perfunctory."

It would appear to be a good idea for each of us to occasionally evaluate our technics and measure our own performance as we might expect others to do it. Consider carefully the importance of details and objectives so that we may each be realizing the satisfaction of "expertness of execution" in our chosen field.

The Right Job

A FORMER PATIENT of the hospital writes that he has had difficulty in finding the right job. After working for a period at a vocation for which he had a particular aptitude, he gave it up because the opportunities for financial advancement were limited. He rejected another vocation in which he had a great personal interest because to follow it in earnest would have meant living in a section of the country which he did not especially like. A third type of job was rejected because of the long working hours involved, and a fourth, because of the pace at which the work had to be carried on.

That there is a job for everyone completely right in all respects is a myth. Life is a constant process of adjusting to situations and relationships that are less than ideal, and one of the major tests of emotional maturity is the ability to make this adjustment. Unfortunately, the person who has had speech trouble or some other personality difficulty frequently has avoided or been shielded from the life experiences that teach this important lesson. In consequence, he often remains emotionally at the

level of the child where everything is sharply divided into two mutually exclusive categories—good or bad, black or white, completely right or wholly unacceptable. This unrealistic view that everything must be ideal or else must be rejected causes difficulty in all the individual's relationships.

Much is written about learning to adjust to life and the need to face reality, but it is perhaps too little emphasized that "life" and "reality" consist of many things that are uncomfortable, unpleasant and frustrating, and that it is the ability to take in stride these aspects of living that makes for good adjustment. In almost no situation or relationship is it possible to have everything that might be desired, but people wise in the ways of living select and work toward those ends which to them are the most important, knowing that to attain them they must give up certain other rewards. These are the people who get along best, are happiest, and contribute most to the happiness of others because they have learned to compromise.

—By RUTH M. CLARK

November 1951 issue of *Talk*, published by the National Hospital for Speech Disorders

World Confederation for Physical Therapy

FIRST CONGRESS—London, England, September 7-12, 1953. Central Hall, Westminster.

THEME—The Patient's Own Activity as the Underlying Principle of Physical Therapy.

Details regarding registration and travel will appear in an early issue of the *Review*. Advance registration for members of the American Physical Therapy Association will be done in the National Office. Thomas Cook and Sons have been designated by the Chartered Society of Physiotherapy as the official agent. Booking of hotel accommodations in London should be done through them as arrangements to have rooms set aside have been made.

Any members planning to attend and wishing to get together with other physical therapists for a combination of vacation and meeting, please write to me.

"Briefs" on the member organizations in the World Confederation will appear in the *Review* in order that we may all be familiar with our colleagues' organizational structure. The first of these are in this issue.

MILDRED ELSON, *President*

Great Britain

The Chartered Society of Physiotherapy originated in 1894 with 4 members. By 1900 its membership had increased to 250 and the Society became incorporated. A Royal Charter was granted in 1920 and the Chartered Society of Massage and Medical Gymnastics came into being, with Her Majesty Queen Mary as its Patron. During the last war it was found that this title did not denote the wide scope of the work undertaken by members, and a further change was made to the "Chartered Society of Physiotherapy."

The Chartered Society has a dual function, in that it is the training, examining, and registering body and also cares for the professional interests and welfare of its members, of whom it has to date registered more than 18,630.

There are 30 Training Schools approved by the Chartered Society and the qualifying examinations are conducted at various centers throughout Great Britain and Eire. The certificates of the Chartered Society are recognized as essential qualifications for employment by the Medical Profession, Hospitals and Government Departments including the Ministry of Health and the Ministry of Pensions. After registration as Chartered Physiotherapists, those desiring additional qualifications may take a course of training and sit for an examination in Hydrotherapy. Those who are attracted to teaching may train for the examination for Teachers of Physiotherapy.

Membership of the Chartered Society is open to those who have passed the Chartered Society's qualifying examinations and have paid the registration fee. Members are entitled to use the designation "Chartered Physiotherapist" or the letters "M.C.S.P." and to wear the Society's badge.

Before admission to membership Chartered Physiotherapists sign an undertaking to observe the following Ethical Bylaws:—

1. Not to undertake any case except under the direction of a registered medical practitioner.
2. Not to sell goods to patients in a professional capacity.

3. Not to accept secret commissions on the sale of goods.

The Council is the executive body of the Chartered Society and is composed of elected and co-opted members. The twenty-four elected members are divided into three sections, representing teachers, private practitioners, and other interests. Six members retire each year, though they are eligible for re-election. There are eight co-opted members, of whom not more than half are members of the medical profession. In addition, there is one representative of each of the fifteen Local Boards. Local Boards are established in areas corresponding to the Ministry of Health Hospital Regions. Through their Representative on Council the Local Boards provide a valuable means of conveying the views of members to Council and of carrying out the policy of the Chartered Society in each area. Local Boards also arrange Congresses and Postregistration Courses in their regions.

The Chartered Society publishes "Physiotherapy," a monthly journal, which is devoted to matters of professional interest. It contains articles on various aspects of physiotherapy and on current affairs, and, through its correspondence columns, reports and announcements that keep members informed of the Society's activities.

Fellowships are awarded by the Council to members presenting a thesis and demonstration of cases showing wide knowledge and experience in the profession.

On returning from the meetings in Copenhagen and Stockholm, the Chartered Society's representatives had little more than a week before the Society's own Congress began. This lasted three days and a varied program included lectures, practical demonstrations and visits to many hospitals and places of interest within reach of London.

The Congress was opened by Sir John Charles, Chief Medical Officer to the Ministry of Health, and the Minister of Health was the principal guest at the Society's dinner at the Waldorf Hotel at the close of the Congress.

The Chartered Society was very pleased to welcome to the Congress a number of members of the American Physical Therapy Association, the Australian Physiotherapy Association and the New Zealand Society of Physiotherapists.

UN Commission Reviews Development of International Rehabilitation Program

The Social Commission of the United Nations, meeting in its eighth session at the UN Headquarters in New York on May 13th, reviewed the action which has been taken in the development of a "coordinated international program for the social rehabilitation of the physically handicapped." Originally recommended by the Social Commission in 1949 and approved by the Economic and Social Council at its eleventh session in 1950, the program is designed to achieve coordinated planning and action by the United Nations and the interested specialized agencies with the cooperation of governments and non-governmental organizations.

The Commission received a report from the UN Secretary General which summarized action taken to implement the program, a resolution adopted by the Executive Board of the World Health Organization endorsing the coordinated program, and a statement submitted by the International Society for the Welfare of Cripples. Additional information was presented to the Commission by members of the UN secretariat and by representatives of the specialized agencies and of non-governmental organizations.

Donald V. Wilson, Secretary General of the International Society for the Welfare of Cripples, speaking to the Social Commission, emphasized the interest being displayed by non-governmental organizations in all parts of the world in the development of the United Nations coordinated rehabilitation program as well as in other activities designed to improve services for the disabled. The importance of public opinion, which is often expressed through NGOs, to the development of the program was also underlined.

The Fifth World Congress of the International Society for the Welfare of Cripples, where the UN program was presented by Dr. Harold Balme, was cited as an important evidence of the widespread desire for effective international action. The conference of non-governmental organizations, held in Geneva in 1951, was also noted by Mr. Wilson as illustrative of the interest and the willingness of non-governmental groups to participate in international rehabilitation efforts.

He described the cooperative arrangements which exist between the International Society for the Welfare of Cripples and the International Union for Child Welfare. Similar liaison is maintained with the World Veterans' Federation, which has recently adopted a rehabilitation program, and with other international organizations such as the World Confederation for Physical Therapy, the World Medical Association, and the International Congress of Physical Medicine.

All evidence points to a rapidly growing interest in the development of international rehabilitation programs and to a willingness to collaborate for the welfare of the handicapped.

Membership News

Marriages

Bonnie J. Fleming of San Francisco, Calif., now Mrs. Bonnie F. Almond, San Francisco, Calif.
Gertrude Osborne of Charlotte, N. C., now Mrs. Gertrude O. Carter, Durham, N. C.
Capt. Inez Moffitt of San Francisco, Calif., now Capt. Inez M. Del Bene, San Francisco, Calif.
Lt. Freeda James of San Francisco, Calif., now Lt. Freeda J. Dougherty, San Francisco, Calif.
Audrey Bennett of Spokane, Wash., now Mrs. Audrey B. Halden, Spokane, Wash.
Georgia Hegarty of Easton, Pa., now Mrs. Georgia H. Dunkerly, Urbana, Ill.
Marilyn Meyers of New York, N. Y., now Mrs. Marilyn M. Lingua, New York, N. Y.
Jane Barbour of Rutherford, N. J., now Mrs. Jane B. Marsh, Amsterdam, N. Y.
Nina Tange of Whittier, Calif., now Mrs. Nina T. Marth, Los Angeles, Calif.
Nancylee Nicklas of Pittsburgh, Pa., now Mrs. Nancylee N. Mohler, Pittsburgh, Pa.
Antoinette Carpenter of Geneva, Ill., now Mrs. Antoinette C. Morris, Washington, Pa.
Katherine Timoteo of New York, N. Y., to Arthur San Giuliano, New York, N. Y.
Anne P. Stone of Cambridge, England, now Mrs. Anne S. Wolf, Chicago, Ill.
Ruth Holland of Greensboro, N. C., now Mrs. Ruth H. Wood, Greensboro, N. C.

Chapter News

Chapter Exhibits

The following awards were made to chapters for educational exhibits.

First place was given to the Georgia Chapter for the excellence of its exhibit on the recruitment theme.

Second place went to Southern California for an informative exhibit on how to make a Chapter Directory productive financially, while it functions successfully as a public relation medium.

Third place was won by Northern California's chapter-made exhibit which showed other chapters how to build exhibits that are effective yet require small expenditures.

Washington State received honorable mention for the originality of its presentation. All exhibits revealed a widespread interest in wise recruitment methods to meet the need for trained physical therapists. The committee of judges making the awards included Mr. Eugene Taylor, Miss Beatrice Schulz, and Capt. Miriam Rodenberger.

1952 Conference Attendance

Total Registration	881
Members	726
Guests	155

Members were present from 43 states, the District of Columbia, and Puerto Rico. The states not represented were North Dakota, Montana, Utah, Nevada, and Wyoming.

Pennsylvania had the largest number with 137 active and 43 student members. New York ran second with 117 active members and four students. Delaware had 11 present out of a total membership of 15.

There were guests from 17 states, the District of Columbia, Puerto Rico, and 16 physical therapists represented five member organizations of the World Confederation for Physical Therapy—Australia, Canada, Great Britain, Sweden, and Western Germany.

Election Results

President	Harriet S. Lee
Vice-president	Mary E. Nesbitt
Secretary	Dorothy Voss
Treasurer	R. Lewis Brown
Speaker, House of Delegates	E. Jane Carlin
Directors	Mary Clyde Singleton
	Dorothy Fredrickson

March of Dimes Grant

A March of Dimes grant of $20,000 will enable the American Physical Therapy Association to give consultation to schools of physical therapy as well as to individual therapists in its over-all educational and service programs. The awarding of the grant, which will be under the direction of Mildred Elson, Executive Director of the Association, was announced jointly by Basil O'Connor, President of the National Foundation for Infantile Paralysis, and Mary Singleton, President of the American Physical Therapy Association.

Since 1944 a broad educational program has been undertaken by the American Physical Therapy Association with the assistance of the National Foundation for Infantile Paralysis to recruit more

students for physical therapy training, to make more effective the professional training of the students, to provide visual aids and instructional material to meet the needs of graduate physical therapists in providing better care for poliomyelitis patients and to improve personnel practices in the field.

In addition to carrying on this broad educational program, the new March of Dimes grant will enable the Association to prepare a Curriculum Guide for new schools of physical therapy. The Curriculum Guide will emphasize the importance of more instruction and clinical practice in home care.

Association officials point out that it is becoming impossible to care for large numbers of polio patients in institutions for long periods of time because of the lack of hospital beds, and the prohibitively high cost of institutional care. The Association will provide consultation service to the agencies providing physical therapists for home care as well as to the physical therapists thus employed.

Medical Diathermy Deadline Extended

As a result of a petition filed by the Council on Physical Medicine and Rehabilitation of the American Medical Association, and comments and briefs by others in support of the petition, a one-year extension to June 1953 has been authorized by the Federal Communications Commission. Nonconforming diathermy equipment therefore need not be replaced until that date.

Are You Writing An Article for the *Review*?

Has *your* name appeared in the "Meet Our New Contributors" column? Chances are that during the past year you have tried a new device, technic, or pet theory with successful results and we would like to hear about it. Remember that the *Review* is yours to use and your article, case report, or description of a new device will be courteously received. To assist you may we suggest the following:

1. Papers should be typewritten, double-spaced.
2. Full name and title of authors and listing of all professional connections should be given.
3. References and bibliography numbered and listed at end of paper should include:
   a. Author's last name, first name, initial.
   b. Title of book or paper.
   c. Name of publisher or magazine.
   d. Date of publication.
4. Illustrations should be unmounted and numbered to correspond to references in the text.
   a. Captions to appear under illustrations should be typed on a separate sheet and numbered to correspond to the illustrations.
   b. All photographs submitted should be glossy prints.
   c. All charts and drawings should be on white paper, typewritten or made with black India ink.

Papers should be sent to Editor, The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

Coming Meetings

The annual conference of the American Association of Medical Record Librarians is to be held October 15-17, 1952, at the Shoreham Hotel, Washington, D. C.

The 30th annual scientific and clinical session of the American Congress of Physical Medicine will be held on August 25, 26, 27, 28 and 29, 1952 inclusive, at The Roosevelt Hotel, New York, N. Y.

Announcement

The Institute of Physical Medicine and Rehabilitation and New York University-Bellevue Medical Center again offer a four week course in advanced Rehabilitation Methods for Physical Therapists. Further information may be obtained from Edith Buchwald, Director for Rehabilitation Courses for Physical Therapists, 400 East 34 Street, New York, N. Y.

Correction

It was erroneously stated in the June *Review* that Jacob S. Schleichkorn, author of "Organization of a Physical Therapy Program," wrote the article on camping for crippled children while studying under a scholarship from the National Foundation for Infantile Paralysis. Although Mr. Schleichkorn studied under a scholarship from this agency, the paper was written while he was working for his master's degree under a scholarship from the Elks' National Foundation. He received his B.S. degree and his physical therapy training in 1950, and his master's degree in 1952.

REPRINTS AVAILABLE *(Continued from page 415)*

METHODS OF CLINICAL INSTRUCTION IN PHYSICAL THERAPY—*Beatrice E. Whitcomb, Capt., WMSC* (10c)

PHYSICAL THERAPY IN THE HOME—*Arthur L. Watkins, M.D.* (5c)

PHYSICAL THERAPY IN STATE CRIPPLED CHILDREN'S PROGRAM—*Clara M. Arrington* (5c)

THE USE OF LEAD-UP FUNCTIONAL EXERCISES TO SUPPLEMENT MAT WORK—*Morton Hoberman, M.D., Erbert F. Cicenia, Hyman L. Dervitz and Oscar C. Sampson* (10c)

THE REHABILITATION OF APHASICS—*Dorothy Britton* (10c)

Special Materials

BIBLIOGRAPHY ON NATURAL CHILDBIRTH (10c)

READING REFERENCES FOR ELECTRICAL DIAGNOSIS AND ELECTRICAL STIMULATION (10c)

FILM LIST OF SPECIAL INTEREST TO PHYSICAL THERAPISTS AND STUDENT PHYSICAL THERAPISTS
These films may be secured on rental, loan or sale depending on the course. Unless otherwise specified, all films are believed to be 16 mm. (15c)

POLIO ISSUE OF THE *Review* (JULY 1951)—
Contains eight articles by leading physicians and physical therapists. There are thirty-one abstracts from current medical journals. (50c)

CEREBRAL PALSY ISSUE OF THE *Review* (FEBRUARY 1952)—
Contains six articles by outstanding experts in the field of cerebral palsy. (50c)

PHYSIOLOGY OF THE HEART AND CIRCULATION AND ITS CLINICAL APPLICATION IN PHYSICAL MEDICINE—
A bound edition of the papers presented in a symposium at the 1950 annual conference of the American Physical Therapy Association with introduction by Harry D. Bouman, M.D., Coordinator. ($1.00)

ESSENTIALS OF A HOSPITAL DEPARTMENT—PHYSICAL THERAPY—
This manual is designed to supply broad guidance in planning, installing, equipping and administering a physical therapy department in a hospital. Compiled by experts in many fields and published by the American Hospital Association. (To members 25c)

PLAN AND SPECIFICATIONS FOR AN ALL-WELDED STEEL TREATMENT POOL (No charge)

ORGANIZATIONAL GUIDE FOR SCHOOLS OF PHYSICAL THERAPY—
Gives a broad interpretation of the essentials of a physical therapy school as established by the Council on Medical Education and Hospitals of the American Medical Association. (No charge)

Special Polio Issue of the *Review*

The July issue of the *Physical Therapy Review*, which includes timely and informative articles on the treatment of the poliomyelitis patient with emphasis on his care in the respirator, is available at special rates on quantity orders. Single copies of the July 1952 journal are 75c per copy; in orders of 10 to 50 it will be 50c; 50 to 100, 35c; 100 or more, 25c each. There are special rates for students in approved schools of physical therapy.

All requests should be addressed to American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.

Abstracts

First Results of Ultrasonic Waves in Treatment of Buerger's Disease at San Camillo Hospital in Rome

A. D'Agostino and M. Risi. In MINERVA MEDICA, Turin, October 27, 1951. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 148:13:1157, March 29, 1952.

During the first six months of the last year 23 men with thromboangiitis obliterans in whom all prior medical, physical, and surgical treatment had failed were treated with ultrasonic waves. None of the patients had syphilitic or diabetic arteritis, arteriosclerosis, or Raynaud's disease. In four patients who had undergone surgical treatment, gangrene was present in almost all toes, ulceration had progressed to both surfaces of the foot, and general condition was extremely poor. In five patients ulcerations were moderate and limited to one toe, with edema, partial or total cyanosis, ischemia, and pain. In 14 patients the disease was characterized by pain in the calf after slight walking and chills associated with paresthesia in the feet. Ultrasonic wave therapy was carried out locally with the feet of the patients of the first two groups immersed in water. Additional ultrasonic waves were applied to the calf of the 14 patients of the last group. The dose consisted of 1 watt per square centimeter of the surface of the generator (5 sq. cm. in this case) with a frequency of 1,000,000 cycles per second. One daily application lasting two minutes was carried out for 20 days, and after an interval of 20 to 30 days, 20 additional applications followed. Results proved that this is the therapeutic dose of choice. In two of the four patients whose condition was critical, necrosis regressed, proliferation in the necrotic tissues was observed, and edema and the bluish discoloration of the skin disappeared. Conditions were unchanged in the other two. Of the five patients with moderate thromboangiitis obliterans, three recovered completely and improvement was pronounced in the other two. Improvement was likewise gratifying in the remaining 14 patients. The good effects may be attributed to improvement in the collateral circulation of the irradiated zone. Ultrasonic waves liberate histamine from cells. The vasodilating activity of histamine, that after the first few minutes of therapy is increased to four times the initial level, may improve local circulation and lead to restoration of the tissues already impaired by ischemia. The histamine level regresses to normal within one hour. The occurrence of hemorrhages from ulcerations following the first application of ultrasonic waves is a significant indication of vasodilatation. Although the follow-up period is too short to permit a definite evaluation of the results obtained, ultrasonic wave therapy may become a valuable physical agent in treatment of thromboangiitis obliterans.

Physical Medicine for the Neurologic Patient

Arthur L. Watkins, M.D., Boston, Mass. In NEW YORK STATE JOURNAL OF MEDICINE, 52:3:315, February 1, 1952.

The specialties of neurology and physical medicine and rehabilitation have much in common, since the diagnosis and treatment of neuromuscular disorders represent a large proportion of the practice of both fields.

To illustrate the principles employed in physical medicine for the treatment of peripheral nerve lesions, Watkins discusses facial paralysis or Bell's palsy. Electrical tests are performed a week to ten days after the onset, in order to determine the severity of the lesion. The prescription for physical therapy considers first the necessity for splinting to prevent excessive stretching of paralyzed muscle. This is not always necessary in the case of facial paralysis, protection of a sagging eyelid being of prime importance.

Most patients derive some symptomatic comfort from application of warm moist towels to the face or irradiation with an infra-red lamp for fifteen to twenty minutes. This usually is followed by gentle stroking massage, at first in the direction of the corner of the mouth towards the eye; later, when there is some active function, massage may be in the opposite direction to stretch contractures.

The benefits of electrical stimulation are of two varieties. During the paralytic stage, obtaining contractures of the muscles is of great psychologic value in many patients. During this stage of paralysis passive exercises are useful to maintain proper length of muscles, and this is particularly true in the case of muscles of the extremities where joint motion also must be maintained. As reinnervation occurs the patient should be instructed in active reeducation, which is best done in front of the mirror.

Electrical tests are useful for purposes of prognosis, as a recent study indicated that all patients with normal response had complete recovery. Although these same principles of treatment are utilized in the care of patients with peripheral nerve injuries of the extremities, peripheral neuritis, and poliomyelitis, there are other methods of treatment of special value, such as progressive resistance exercises to hasten improvement in muscle strength.

The patient with hemiplegia gives us a typical example of an upper motor neuron disorder with its components of motor and sensory disability. As soon as the medical measures necessary to save life have been instituted, physical medicine may be prescribed. Positioning in bed to prevent footdrop and external rotation is the first consideration. Gentle passive exercise may be started as soon as it is evident that the patient will survive.

When the general condition permits, the physical therapist should attempt active reeducation of any functioning muscle groups. One generally starts with gross movements of the hip, shoulder, knee, and elbow, as these motions return before the function of the distal portion of the extremities. During the early, more flaccid stage, one may wish to stimulate the stretch reflex by passive motion in order to bring contraction of the muscles. As soon as spasticity is well established, any forceful or sudden passive motion which stimulates the stretch reflex should be avoided, as it then interferes with voluntary control movement.

Massage has been found to be of limited value. During the period of complete paralysis it may be used for tonic effect on the circulation. Later, with returning power and increasing spasticity, it is to be avoided unless very skillfully given, since it may overstimulate reflexes. This is particularly true of mechanical vibratory devices.

The importance of using electrical stimulation is open to some question. However, mechanical aids should not be overlooked, for a shoulder pulley under the patient's own control is an excellent way of maintaining motion of this joint.

Treatment of Some Complications of Colles' Fracture

Miland E. Knapp, M.D., Minneapolis. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 148:10: 825, March 8, 1952.

Colles' fractures is a fracture of the lower end of the radius, within one inch of the articular surface of the radius, which may or may not be accompanied by a fracture of the styloid process of the ulna. The usual deformity is threefold: posterior displacement, posterior angulation, and radial deviation of the hand at the wrist. It is probably the commonest of all fractures, and the shoulder often is involved.

This shoulder involvement probably is due not so much to direct trauma caused by falling on the shoulder or trauma produced by the force exerted through the arm to the shoulder, as it is due to immobilization. The common practice of carrying the arm in a sling promotes such disability. In most cases, shoulder disability can be prevented by putting the hand behind the head and behind the back, daily. Putting the hand behind the head causes abduction and external rotation; putting the hand behind the back requires extension, adduction, and internal rotation. With these two exercises, all the more difficult movements are carried out. Sometimes heat, massage, and exercise are necessary, particularly if activity has been limited during the early stages.

Unfortunately, many surgeons associate the term "physical therapy" with machine therapy. It is well known that physical therapy implies exercise, yet, in THE JOURNAL, the following statement was made by Cassebaum in an otherwise excellent report of a study of results in Colles' fracture: "When the splints were removed, active motion and exercises of the wrist were begun. These have a twofold purpose, namely, to increase motion and to redevelop the forearm muscles. Physical therapy was not used unless it was requested, and then its relative inferiority to active exercise was impressed on the patient. It was used for the occasional demoralized person who needed the feeling that something was being done for him and that others were interested. Through it more frequent contact with the patient was maintained. The daily application of moist heat proved helpful, and patients reported increased ranges of motion during this treatment."

Knapp feels if we are to adhere to a definition of "physical therapy" as meaning treatment by physical means, including rest and manipulation as well as exercise, the entire care of the fracture, including the reduction and application of the cast, consists of physical therapy.

When post-traumatic fibrosis develops, the use of heat, preferably by whirlpool baths, followed by massage to reduce swelling, relieve pains, and stretch fibrous tissue, and then followed by exercise, using resistance exercises whenever possible, greatly expedites the return of function. Forcible manipulation, with or without anesthesia, is contraindicated, as it increases the trauma and swelling and, therefore, defeats its own objective. Occupational therapy provides excellent forms of exercise that can be adapted to increase the range of finger and wrist motion and increase strength and skill; in addition it may hold the interest of the patient, so that he will work at it for longer periods and more effectively than at other forms of exercise.

The Treatment of Recent Transcervical Fractures of Femur

D. O. Williams and E. K. McLean. In BRITISH MEDICAL JOURNAL, No. 4758, p. 580, March 15, 1952.

This is a report of a simple method of treating adduction fractures of the femoral neck and also abduction fractures which have disimpacted. The results appear to be satisfactory according to modern standards. Bone grafting was not carried out in any case.

Following operation various methods of restricting external rotation of the injured limb were tried and discarded. As a routine measure the authors now use the abduction frame designed by McLean (1949). This frame prevents external rotation and adduction of the limb while permitting flexion and extension of the knee and hip joints. It also acts as a bed-cradle, thus relieving the legs of the weight of the bedclothes.

The day after operation active exercises under the direction of a physical therapist are begun, all movements of the hip, knee, and ankle being permitted except external rotation and adduction of the hip joint.

At the end of one month a radiograph of the injured hip is taken, and if the position of the nail and of the bony fragments has been maintained the patient is allowed up daily for non-weight-bearing exercises on crutches. Further x-ray films are taken at intervals of a month, and, provided that there is radiological evidence of bony union, graduated weight-bearing exercises are begun at the end of three months. If union has not occurred, or its degree is doubtful, weight-bearing is postponed until it is definitely present, and this may mean a delay of six months or more in some cases.

If home conditions are satisfactory and the general condition of the patient is good, he is discharged from the hospital when he has learned to manage crutches. Most of the patients included in this report remained in hospital for the full three months, principally because they lived alone.

The Role of Physical Medicine and Rehabilitation in a Large Neuropsychiatric Hospital

Daniel Dancik, M.D., Long Island, N. Y. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 148:11: 921, March 15, 1952.

A physical medicine and rehabilitation service in a neuropsychiatric hospital, with its psychological orientation, its recognition of the importance of socially integrating the patient into the hospital milieu, and its goal of integrating all other therapeutic auxiliaries in the hospital, when administered by a psychiatrist specially trained in its application, is one answer to the problem of the ever-increasing patient population.

Physical medicine and rehabilitation, in addition to its value as supportive treatment for a large number of early psychotics who respond favorably to other accepted psychotherapeutic modalities, provides the best means of therapy for those who do not respond to these measures. Karl Menninger has aptly stated that the neuropsychiatric patient invariably cannot work or play. Therefore, to teach such a patient how to work and how to play is to teach him how to adjust. Physical medicine and rehabilitation must try to make it possible for the patient to find an outlet for his institutional urges in work and play.

The physical medicine and rehabilitation service, as presently constituted at the Northport Hospital, consists of five specialized therapy segments, namely, occupational therapy, manual arts therapy, corrective

therapy, physical therapy and educational therapy. This service is staffed by psychiatrically oriented therapists and is guided by a psychiatrist who is physiatrically inclined.

Corrective therapy provides physical reconditioning activities for the purpose of offsetting advance of physiological retrogression during the regressive and deteriorative phases of chronic psychosis. It is directed toward the restoration of full strength and stamina through participation in progressively graded physical activities.

Physical therapy in a large neuropsychiatric hospital finds many fruitful applications. Hydrotherapy at the Northport Hospital is psychiatrically and physiatrically oriented to the extent of being medically controlled instead of being a simple nursing procedure. It is used for treatment purposes only, is carefully observed and controlled, and the feeling of punishment is removed and restraining factors lessened by the proper training and guidance of the hydrotherapy aides. Physical therapy procedures have been found successful not only in treatment of the commoner physical disabilities but also in the treatment of functional peripheral vascular disorders resulting from hypostasis. Physical therapy is used at Northport to alleviate or prevent any physical disability.

For the institutional psychiatrist who finds himself overwhelmed by the responsibilities of care of a large number of patients, a physical medicine and rehabilitation service provides a laboratory where patients exposed to the modalities of such a program can be carefully observed. It is also felt that a physical medicine and rehabilitation service in a neuropsychiatric hospital will assist in changing the ordinary conception of a psychiatric institution to one in which it is realized that "each individual patient will acquire habits and skills that will contribute to his social and economic integration."

Ischemic Necrosis of the Anterior Tibial Muscle: Report of a Case

Raoul C. Psaki, Lt. Col., M.C., U.S.A., and Charles D. Shields, Lt. Col., M.C., U.S.A. In ARCHIVES OF PHYSICAL MEDICINE, 33:3:153, March 1952.

Necrosis of a muscle or group of muscles can be anticipated following adequate trauma that obliterates the blood supply. The anterior tibial muscle seems to be particularly vulnerable to ischemic necrosis from mild and indirect trauma.

A case of anterior tibial muscle necrosis with partial common peroneal nerve involvement is reported. Electrographic studies were made to assist in the diagnosis of the case. The patient received hydrotherapy in the form of whirlpool baths for the lower left extremity; electrotherapy (electrical stimulation) of involved muscles; active assistive to active exercise to mobilize the ankle and foot joints; and progressive resistive exercise to produce hypertrophy of the remaining muscle fibers.

In spite of continuous, vigorous therapy, the patient failed to show further functional improvement, until a left lumbar sympathectomy was performed. The physical medicine regime was then reinstituted ten days following this procedure and a marked softening in the region of the tough, fibrotic tissue ensued. The functional improvement following the sympathectomy was due to the increased blood supply and hypertrophy of the viable muscle tissue present.

Pole Top and Other Manual Resuscitation Methods: A Comparison Study

Archer S. Gordon, Max S. Sadove, Frank Raymon, and A. C. Ivy, Chicago. In INDUSTRIAL MEDICINE AND SURGERY, 21:4:147, April 1952.

Comparative tests of pole top and manual resuscitation technics, as carried out on normal adults curarized-anesthetized to total apnea, confirm the finding that push-pull methods are two to three times as efficient, as regards pulmonary ventilation, as either the push only or the pull only methods. For general purposes the arm-lift back-pressure (back-pressure arm-lift) modified from the Danish Nielson method, should be used, since it is easy to teach, can be performed by most operators for prolonged periods of time, and gives excellent pulmonary ventilation without circulatory embarrassment. Trained personnel should also be acquainted with the hip-lift back-pressure and Silvester arm-lift chest-pressure methods to be used as ready alternatives in special circumstances.

The pole top method of resuscitation gives adequate ventilation, and should be instituted immediately in cases where linemen are shocked on the poles. However, since the vertical position predisposes to peripheral stasis and circulatory embarrassment, as well as impeding the drainage of fluids which may collect in the oropharynx, the victim should be lowered to the ground as soon as practical. The pole top method should be continued during the descent, and one of the more efficient push-pull methods begun as soon as the person can be placed in the prone position.

Combined Use of Cortisone and Physical Therapy in the Treatment of Arthritic Deformities

William Benham Snow, M.D., and James A. Coss, M.D., New York City. In NEW YORK STATE JOURNAL OF MEDICINE, 52:3:319, February 1, 1952.

This report is concerned with patients who have had fairly longstanding arthritis with loss of muscle strength, easy fatigability, apparently irreversible contractures, and deformities. The several cases reported show that physical or medical procedures alone could not help because the disease activity would not allow intensive exercise. ACTH or cortisone alone was not completely effective because severe contractures and deformities change very little without the addition of intensive physical measures.

The usual management of these cases has been as follows: A determination of the type and status of the case is made as a result of complete medical work-up. A record is made of present deformities, and the patient is then given either cortisone or ACTH for a test period of about one week. At this point the physiologic effect of the drug has lessened the pain and visibly reduced the inflammatory process and lessened the usual tendency of tissue reaction to activity. This permits the application of vigorous physical therapy even beyond the point of pain. Tight, shortened muscles are passively stretched; casts often are applied to joints showing flexion deformities. After two or three days these casts are bivalved to permit further and continuous forceful passive and active exercise of the joint.

All joints with reduced range of motion are manipulated unless definite ankylosis is present. These manipulations must be carried out with respect and by definitely accepted methods of procedure. It is usually possible to carry out these manipulations with but moderate pain and

within the limit of fixed deformity to effect considerable increase in range of movement as a result of the effort.

Following this the patient is instructed in and advised to carry out exercises to maintain the new range of movement which has been established. These exercises are repeated by the patient several times a day. Specially prescribed occupational therapy routines add much to this portion of the program. If there is any increase in pain or any inflammatory sequelae to the manipulation, hot applications and massage are also given.

The patient is ambulated as soon as possible after the physical therapy is started. Ambulation is enhanced by the use of temporary extension braces which hold the position of increased extension in cases where, with weight bearing inability due to influence of gravity and weak quadriceps, effective walking would be prevented.

Depending upon the degree of postural imbalance and muscular weakness, different aids to walking are utilized. Frequent periods of walking are encouraged. When muscles show weakness due to disuse, they are treated by a strenuous routine of progressively weighted resistive exercises. These exercises not only strengthen the muscles, but the effort called forth to overcome the weights applied results in further increase in the range of movement.

Parkinsonism

Hugh G. Garland. In BRITISH MEDICAL JOURNAL, No. 4750, January 19, 1952.

Parkinsonism is an irreversible process, and no patient has ever been cured. A small proportion of postencephalitic cases become stationary for very long periods, and perhaps indefinitely, but all other forms of Parkinsonism are inevitably progressive sooner or later, though often with stationary phases.

Physical therapy probably is as important as medicinal treatment. The essential part of physical therapy is vigorous active exercises employed for all limbs, and in the very advanced Parkinsonian daily passive movements of all joints are essential. Hot baths often will relieve the disability in the joints and to some extent the general stiffness. Massage, all forms of electricity, and all emanations have no particular value in the disease.

Rehabilitation in Industrial Geriatrics: A Preliminary Report

Leo Dobrin, M.D., New York City. In NEW YORK STATE JOURNAL OF MEDICINE, 52:1:81, January 1, 1952.

The medical, social, and economic problems presented by our aging population are receiving increasing attention on national and local planning levels, but to the average professional worker in the field of physical medicine and rehabilitation, geriatric rehabilitation is, at best, "something to think about" or, at worst, "hardly worth-while."

There are now twelve million people over sixty-five years of age in this country. The application of the principles and technics of rehabilitation to a group of 67 men and women averaging 76.6 years of age, residents of a modern home for the aged, is described in this article. These methods make possible the restoration to normal activity of elderly individuals suffering from the results of cerebrovascular accidents, of various types of arthritis, of ununited hip fractures, of amputations, and of a variety of life-long disabilities. Physical rehabilitation thus makes a great positive contribution to the physical and mental health of the aged by actively combating what were once regarded as hopeless and progressive infirmities. The Department of Physical Medicine and Rehabilitation has taken its place with the other services and activities of the institution which are designed to make life significant and worth-while for the residents without regard for chronologic age.

Ultrasound and Industrial Medicine

Horace O. Parrack, Major, USAF, Dayton, Ohio. In INDUSTRIAL MEDICINE AND SURGERY, 21:4:156, April 1952.

Ultrasound equipment is being used more and more extensively in industrial situations. It is used to detect flaws in materials, to determine certain properties of materials, to secure dispersion of solids in liquids (emulsion), for agglomeration of particles from liquids and gases, and many other jobs.

Ultrasound is being extensively used in biology and medicine, where its application may be classified under two general headings: (1) experimental studies using ultrasound, and (2) therapeutic methods utilizing ultrasound. The literature in these biological fields is already extensive, and more work is undertaken daily.

The experimental studies in which ultrasound is employed usually have one of the following purposes: (1) the determination of the physical properties of the tissue studied; (2) the determination of the mechanisms by which ultrasonic energy produces an effect on biological material; (3) the determination of the effect of ultrasound on physiological functions of tissue; (4) the ultrasound is used as a tool to perform localized injury or destruction of tissue for the purpose of evaluating the *usual* function of the tissue area destroyed, or rendered non-functional.

Because various tissues and body structures have different capacities for reflecting or absorbing ultrasound it may be possible to utilize these effects in localizing or determining the dimensions of these structures. Foreign bodies or crystal secretions located in some part of the body may possibly be located by the application of ultrasonic waves. These applications are essentially diagnostic.

Ultrasonic energy also has been used for various therapeutic purposes, the most of these applications having been made in Germany. There still is much uncertainty as to its effectiveness. Certainly much caution should be exercised in therapeutic applications until it is established: (1) that ultrasound is an effective agent, and (2) that it can be applied in such a manner that it will not produce unexpected damage.

The question of the damaging action of air-borne ultrasonics is discussed. It is concluded that a probable hazard exists, and that the hazard will increase as the use of ultrasonic generators increases. However, control of these hazards should be a relatively easy task.

Adapted Wheel Chair for Above-Knee Amputees (A Preliminary Report)

Carl M. Akwa, M.D., Ray Piaskoski, M.D., Edwin C. Welsh, M.D., and Leslie M. Root, Wood, Wis. In ARCHIVES OF PHYSICAL MEDICINE, 33:3:156, March 1952.

Flexion contractures in the hips of above-knee amputees have been one of the major problems confronting orthopedists, brace makers, and, more recently, physiatrists. Correct fitting for above-knee prostheses has been impossible in many cases because of hip flexion contractures. Since flexion contractures often result from continuous use of the

conventional type of wheel chair, a simple wheel chair attachment, interchangeable for right or left amputees, has been devised and is described in this article. This attachment also may be useful for the correction of contractures already developed. The device can be attached easily to any conventional collapsible wheel chair, and can be removed to reconvert the chair for normal use.

Operative Treatment of Degenerative Arthritis of the Hip

Fred C. Reynolds, M.D., and J. Albert Key, M.D. In GERIATRICS, 7:1:1, January-February 1952.

The term *degenerative arthritis of the hip* is used to designate the condition which also is known as osteoarthritis, hypertrophic arthritis, senile arthritis of the hip, or malum coxa senilis. This is a condition of the adult hip which is characterized by pain, limitation of movement, deformity, and a variable amount of disability.

Before treatment, it is important to evaluate not only the condition of the hip but also the patient's general health, age, economic status, and mental outlook. In most instances, one of the principal objects of treatment is relief of pain; the second, stability in a satisfactory position; and the third, range of motion. Before undertaking any surgical procedure it is important to consider what can be achieved by nonoperative methods. Although the condition generally tends to progress, the disability may remain stabilized indefinitely or may even lessen and the patient may be reconciled to a moderate amount of disability.

The most important conservative measure is rest or relative rest to the hip. This usually can be obtained by prescribing a crutch or cane in walking, by restricting activities and if the patient is too heavy, by reducing weight to a satisfactory level. Non-weight bearing exercises may be given in an effort to improve the musculature and increase the range of motion. If the patient is having much pain he may be subjected to a short period of traction in bed.

Major surgery should be reserved for those patients whose disability occurs fairly early in life and in whom we must attempt to provide a stable, painless hip that will withstand prolonged active use, or to the elderly patient who remains disabled after simple measures have failed.

The Painful Shoulder

R. J. W. Withers, M.D. In BRITISH MEDICAL JOURNAL, No. 4748, p. 40, January 5, 1952.

For rupture of the supraspinatus tendon, conservative measures are adopted in all cases, and the arm is put at complete rest either in an abduction shoulder splint, or with the arm at the side in a sling or bandaged to the chest wall.

If there is return of some shoulder elevation within four to six weeks conservative measures can be continued and physical therapy and exercises will complete the return of shoulder function. When no recovery of elevation has occurred in six weeks, operation is advised to repair the ruptured supraspinatus. The after-care consists of rest for the shoulder with the arm in a comfortable position—the author does not use an abduction splint now—until pain and joint irritability have subsided, thereafter active exercises aided by hot packs and assisted movements from the physical therapist.

When a painful arc of movement during midelevation of the shoulder has developed, conservative measures are adopted at first and consist in teaching the patient how to avoid if possible those movements which cause pain. Repeated injections of procaine into the subdeltoid bursa also help, but it is difficult to see how physical therapy in any form can effect lasting change. About five out of every six cases eventually clear up whether "treated" or left to their own devices. The remainder should be treated surgically.

Patients with frozen shoulder should be divided into the subgroups of (1) irritative lesions, where there is a full range of passive movements, and (2) adhesive lesions, where movement is restricted but can be freed by manipulation.

Treatment of irritative lesions is primarily by rest—support of the arm in a sling being easiest for the patient. There are no real advantages in keeping the arm in an abduction shoulder splint; instead, this often increases pain. Heat in one of its various forms usually is ordered, but in a considerable number of cases this treatment may increase the pain and have to be stopped. If complete rest is given to the shoulder the severe pain gradually subsides in four to six weeks, and as soon as this occurs gentle exercises for the shoulder should be encouraged, aided if need be by massage. Exercises in a supine position are most effective. In the average case return of function may be expected in three to four months, though it may take eight months or even a year in the worst cases.

In many cases replacement fibrosis occurs after the acute irritative stage has passed. At this stage pain is much less severe and usually occurs only on attempted movement. While the shoulder is still "frozen," there is a little movement at the shoulder-joint, so that, along with the scapular glide, the arm usually can be elevated by the patient to about a right-angle. At this stage manipulation of the shoulder under anesthesia is called for, when full movement usually can be obtained with palpable or even audible "snaps" which are due to the breaking down of adhesions. The manipulation must be carried out very gently, and, as a first measure, should be through full lateral rotation only. Often one manipulation is enough to free the joint, and it is usually found that after manipulation physical therapy is a real help in hastening full recovery.

Fractures About the Elbow in Children

Francis J. Cox, M.D., Melvin T. Hurley, M.D., and Richard B. Compton, M.D., San Francisco. In CALIFORNIA MEDICINE, 76:1:13, January 1952.

The authors report clinical experiences in the treatment of 135 cases of fractures of the elbow region in children in which 60 cases have been followed to an end-result.

A detailed mode of treatment for supracondylar fractures, fractures of the medial epicondyle, and fractures of the lateral condyle and capitellum is discussed, and the pitfalls in treatment and causes of poor results are given in detail.

In the postimmobilization period, the authors feel that function can best be restored by active use. They state "there is no place for physical therapy in the treatment of fractures about the elbow." Forceful manipulations of a stiffened joint or the carrying of heavy objects will tend only to increase deformities.

The Chronic Low Backache

F. X. Krynicki, M.D., Detroit, Mich. In INDUSTRIAL MEDICINE AND SURGERY, 21:3:111, March 1952.

Patients with a chronic low backache often will get an acute exacerbation of pain within five to fourteen days after wearing especially reinforced and corrected shoes. In the presence of greater irritative changes, however, intravenous procaine, heat, massage, and various oral and parenteral medications are employed in addition. The treatment is used regardless of the duration of the backache. If, after two weeks, little progress is made, the next step is taken.

To begin with, it is necessary to lessen or eliminate spasm which accompanies pain, and it has been found that bilateral, discontinuous traction of the partly flexed extremities is most suitable for this purpose. No traction is used at night and the usual anodynes are given the patient in the early stages of treatment. After the first two days, or when improvement seems apparent, the patient is given special shoes, which he is obliged to wear whenever he is up and about. After traction, the patient is observed for five days or a week during which time he is given physical or medical treatment as mentioned above. If painful symptoms do not lessen, traction is reapplied for a second or a third time as indicated. Physical and medical treatment is continued for about six to twelve weeks, although some patients require less or more attention. When patients are refractory to an absolute degree in the first two to three weeks, and are definite about their condition, little of a conservative nature can be done for them.

Guillain-Barre Syndrome: Report of Case Following Measles

I. Blanche Bourne, M.D., and Roland B. Scott, M.D., Washington, D. C. In ARCHIVES OF PEDIATRICS, 69:1:1, January 1952.

The Guillain-Barre syndrome was once thought to be rare in children. However, an increasing number of cases are being reported, and this particular article concerns a child in whom the Guillain-Barre syndrome followed an attack of measles.

At admission the child complained of weakness in the legs. The deep reflexes were depressed, this being more marked in the lower extremities. After admission the patient became progressively weaker, and was unable to move both upper and lower extremities voluntarily. On the seventh hospital day, the muscular weakness was unchanged, but the patient appeared more alert and was less querulous. He was in pain, however, when manipulated in any manner. On the twelfth day, he could move the upper extremities, but could not pick up objects.

Therapy was mainly symptomatic and supportive at all times. Physical therapy in the form of hydrotherapy, passive exercise, massage, and nonluminous heat to extremities was started on the fourteenth hospital day and continued until discharge.

On the basis of the initial complaint and findings, the diagnosis of measles encephalomyelitis was first entertained. However, in view of the clinical progress of the illness, the Guillain-Barre syndrome following measles became the logical explanation for the child's clinical picture which was characterized by ascending, symmetrical paralysis, marked motor weakness overshadowing negligible sensory changes; albuminocytologic dissociation in the spinal fluid, and gradual, but complete, recovery.

The Use of Hemo-Irradiation (Knott Technique) in Eye Infections

Donald F. Farmer, M.D., Clifford P. Sullivan, M.D., and William B. Sullivan, M.D., Chicago. In INDUSTRIAL MEDICINE AND SURGERY, 21: 4:183, April 1952.

In August 1950 the authors became interested in the effect of ultraviolet blood irradiation on various infections of the eye. A case of iridocyclitis was selected for the initial study and the results of the treatment of this case were so outstanding that encouragement was found not only to continue the study, but even to enlarge the projection of the original investigation. All of the work so done has been on private patients and, therefore, subject to the limitations placed upon research work carried out in a private institution upon private patients.

Many of the cases that have been treated with UBI (ultraviolet blood irradiation) had previously been treated unsuccessfully by conventional means. A concomitant series was followed for comparative purposes, using antibiotics, Cortisone, Antigen-H, and triple typhoid vaccine. All cases treated with UBI responded exceptionally well, except for one, an iridocyclitis, which also failed to respond to conventional therapy. This case gradually underwent a dissolution and no form of therapy can be given credit as an aid.

A comparison of the cases of iridocyclitis treated with UBI and conventional therapy shows a marked difference in the end results. The outstanding point in this comparison is that the cases treated with UBI were singularly free of sequelae, such as posterior synechiae (adhesions of the iris to the lens), exudates on the anterior lens capsule, heavy keratic precipitates, with the attendant loss of vision. The above-named sequelae were present, and of a permanent nature, in 30 per cent of the control group. In the series treated with UBI, which includes a case of sympathetic ophthalmia, a form of uveitis noted for its plastic inflammation and adhesive tendencies, there was complete freedom from sequelae. As one would expect, with the absence of these complications, there was no case that showed a reduced visual acuity due to the iridocyclitis in the series treated with UBI.

One of the outstanding subjective symptoms present in iridocyclitis is pain. In the UBI series of cases the pain was relieved to the point where the patient was comfortable in an average of 10.6 hours.

A Remedial Occupational Therapy Program for the Residuals of Rheumatoid Arthritis of the Hand

Donald L. Rose, M.D., and Laverna I. Wallace, B.A. In AMERICAN JOURNAL OF PHYSICAL MEDICINE, 31:1: 5, February 1952.

Explanations are offered for the mechanisms by which two of the common deformities of the hand seen in rheumatoid arthritis arise. Flexion of the metacarpophalangeal joints is believed to occur as a result of the shearing forces on these joints which necessarily accompany finger flexion. Ulnar deviation of the phalanges is believed to result at least in part from weakness of the first and second dorsal interossei, which has its origin in disuse due to pain on movement. Manual counterpressure over the metacarpophalangeal and interphalangeal joints can nullify these shearing forces, yet permit finger flexion exercises to be conducted. Gripping of a cone-shaped handle provides a means for overcoming ulnar deviation of the phalanges.

Neurosurgical Aspects of Spinal Cord Injury

Edmund A. Smolik, M.S., M.D., F.A.C.S., St. Louis, Mo. In MISSISSIPPI VALLEY MEDICAL JOURNAL, 74:2:38, March 1952.

Spinal injuries in their neurosurgical aspects can be considered from various viewpoints. For simplicity, a classification based on anatomical derangement may be useful. In this category belong:

(1) a. Cervical Neuritis.
b. Cephalalgia of Neuritic (Cervical) Origin.
(2) Cervical Arthritis (Osteophytes).
(3) Intervertebral Disc Rupture.
(4) Vertebral Fractures.

Ideally, the patient should be hospitalized at rehabilitation centers. Here, the entire individual and his problem become a matter of coordination in which the physical therapist, the trained nurse, the neurological surgeon, the neurologist, the psychiatrist, social service worker and the orthopedic surgeon work as an integral team. Rehabilitation is not only in the somatic but in the psychic field. Permanent braces, stimulation by early ambulation and physical therapy, is worth more than any isolated, operative maneuver.

Foreign Abstracts and Reviews . . . .

About the Term "Cellulitis." *By Johanna Kolbe, Muenchen. Krankengymnastik, Vol. 3, No. 6, June 1952. (Translated and abstracted by Irmgard Bartenieff, Supervisor of Physical Therapy, Polio Service, Willard Parker Hospital, New York.)*

The term "cellulitis," as it appears in French and Swedish literature in connection with massage technics, deserves some clarification. It would seem to imply an inflammatory process which contraindicates the use of massage. Actually, however, it is used for certain characteristic changes in the subcutaneous tissue.

Other authors call the same findings: panniculitis dolorosa, cellulalgia, adiposalgia (Faber, Copenhagen), subcutaneous fibrositis (England), organized edemae (Lindskog, Sweden), Dercum's disease. Though the word "cellulitis" is not adequately descriptive it has been in use for several decades, especially in France (Paviot, Lyon) and in Sweden (Molin, Lindskog). From their publications, it becomes apparent the term is used for two types of tissue changes: 1) what is described in the German literature as adipositas dolorosa, fatty knots in the subcutis that are clearly defined and only slightly movable over the underlying tissue. Sometimes these pealike thickenings are organized into more solid masses with a tendency towards specific localizations (inside the knee joint, back of upper arms, over the glutei near the pelvic rim.); 2) the pinlike grains in the subcutis which can be palpated less grossly than the adipose knots and are less movable. Some authors assume definite connection between their localization and various organic diseases.

"Cellulites" are palpated in deeper layers of tissue: at the origin of muscles in postural defects; at the capsules of joints in arthritic disease. "Hartspann" (hypertonus and hardening of muscles) of the back musculature is described as "a long, hard ribbon of cellulites." Lindskog, Sweden, palpates "knots and thickening" in the subcutaneous tissue at right angle to the surface of the skin; he crushes the smallest particles by vertical pressure. For most effective massage of these parts, Lindskog advises parallel application to the surface of the body while picking up and rolling the skin against the underlying tissue.

Prof. Laroche, France, describes thickening of tissue caused possibly by constitutional factors; he asks for a massage technic specifically adapted in depth and localization to specific tissue changes in different pathologies. He attributes the effect of such technics to the releasing stimulus exerted on the tissue by pull and pressure (Zugreiz) rather than to actual crushing of hardened particles.

Some authors consider cellulites a primary pathology and periarthritis a result of cellulitic infiltration of the connective tissue. They speak of "cellulitic pathologies of capsules, synoviae and nerve sheaths." For Paviot, France, these cellulites were always secondary pathologies indicating rheumatic and static changes. He also speaks of "cellulitic phenomena" in circulatory disturbances, migraine and neuralgia. Dr. Molin-Stockholm emphasizes that the anatomical pathology of cellulitis is not yet known. He enumerates the tissues in which cellulitic changes may occur as subcutaneous tissue, pelvic connective tissue, and synovia. He finds that treatment of cellulites by vibration of the abdominal wall relieves functional disturbances of inner organs "through influence on the plexus coeliacus."

In a similar way Thure-Branndt massage in gynecological conditions attempts to remove cellulitic infiltrations of the connective tissue of the pelvis and abdominal wall.

In German massage literature the term "cellulitis is mentioned only wherever a close connection with the Swedish school exists; Port sharply distinguishes cellulitis from the pathology first described by Dercum as "adipositas dolorosa." He speaks of cellulitis mainly in connection with rheumatic disease. He implies that cellulitic changes may constitute colloidal changes with additional connective tissue infiltration.

The concept that changes in the subcutaneous tissue and in hardened muscle constitute a gel state of that particular tissue which is retransformed into a sol state by massage, has been established by Schade and Fritz Lange. Along with this concept sometimes the term "Hautgelose" (gelotic state of the cutis) is used. This nearly coincides with what the Swedish call "cellulitis" except that they do not include Dercum adipose knots. Not only does the German school consider "Hautgelosen" symptomatic of rheumatic disease but it also finds them to be diagnostic signs of functional disturbances of inner organs. They are massed at the maximal points of the Head's zone of a particular organ. Functional disturbances disappear with removal of these "Hautgelosen."

Lindskog's subcutaneous rolling technic over the zonal vibration of Head's zones in organic disease (Kohlrausch) carries over in to Frau Dicke's "Bindegewebsmassage" (tissue release treatment). In all of these technics the aim is restoration of normal movability in all tissue layers.

Translator's remark: the term "Bindegewebsmassage" has been translated "tissue release treatment," the term used by Dr. H. Behrend, Hospital for Joint Diseases, in his lectures on massage.

Book Reviews . . . . .

Rx for Medical Writing. *Edwin P. Jordan, M.D. and Willard C. Shepard. Hard cover. Price, $2.50; pp. 112; illus. 26. W. B. Saunders Company, Philadelphia, London, 1952.*

This book was written primarily to assist the medical writer in the successful preparation and publication of scientific papers. Its sole purpose is to act as a guide to medical writing not as a complete source book.

Basically, the book is divided into four sections: 1) writing in general, 2) use and preparation of illustrations, 3) use of medical statistics, and 4) appendix.

The first portion of the book is written in rather an informal and, at times, humorous manner and considers such topics as choice of subject, outlining, and preparation of the first draft which only approximates the length and scope of the paper. The first, second and third revisions are discussed with such items as choice of language, sentence and paragraph construction, punctuation and spelling, presented for clarification. The title of the paper, the opening sentences (primarily to interest the reader), and summary and conclusions are also discussed. The use of footnotes, making an index and bibliography are simplified for the writer.

There is a chapter on the preparation and use of illustrations. Consideration is given to the types of illustrations which can be used (i.e. photographs, photomicrographs, roentgenographs, engravings and color) and their preparation for publication. Suggestions for proper identification of illustrations, copyright regulations, and the writing of legends for illustrations are given. A table of engraving costs is presented for comparison of prices of various types of engravings.

The use of medical statistics is discussed. This chapter considers the collection, analysis and presentation of statistical data. Simplified formulas are described and hypothetical problems using the formulas are presented for clarification of statistical problems—including average, median, mode, standard deviation, coefficient of variation, Chi square test of probability and chance, and coefficient of correlation. The use of tables and graphs is described and illustrated.

The appendices contain references to both general and medical writing, statistics and style for listing references; common abbreviations in medical transcripts; proofreaders' marks; table of international atomic weights; table of temperature conversion—Fahrenheit to Centigrade and vice-versa; table of X square probability scale.

It is felt that this book makes excellent background reading for those who are about to embark on a course of medical writing for publication. Hints on simplified writing and clarification of writing (relieving some of the fearful aspects of "the first article") are given to assist even the beginning writer. The chapters on the use and preparation of illustrations and medical statistics are particularly well done. This book, in helping solve a definite need in the field of writing for medical publication, will probably prove to be a valuable addition to a library, particularly when used in conjunction with some of the recommended references, and if it is remembered that the book is primarily a guide to more efficient scientific writing and is not an exhaustive source or text book on the subject.

Posture and Pain. *By Henry O. Kendall, Director, Physical Therapy Department; Florence P. Kendall, Assistant Director, Physical Therapy Department; and Dorothy A. Boynton, Physical Therapy Department, Children's Hospital School, Baltimore, Maryland. Cloth; price, $7.00. Pp. 204, illus. 159. Williams and Wilkins Co., Baltimore, 1952.*

Mr. and Mrs. Kendall have had long experience working as a team in physical therapy. The material presented in this book is based on their observations, conclusions, and recommendations from a study of 12,000 cases.

The format of this book is identical with that of their previous publication "Muscles, Testing and Function." It is profusely illustrated with excellent photographs and line drawings with descriptive legends to supplement and clarify the material contained in the text.

The book is divided into four parts. Part I is entitled Alignment. To evaluate postural faults the authors have first described Standard Posture, which they state in this text "refers to an 'ideal' posture rather than an average posture." Chapter II of this part deals with Postural Faults. Part II includes Joint and Muscle Analysis in Relation to Posture, Tests for Muscle Length, Tests for Muscle Strength, and Procedure for Postural Examination. The examination for and analysis of postural defects is most accurately and carefully done and the copy of the Chart for the recording of the findings of the examination provides for informative record keeping.

Part III (Treatment) deals with Pain Associated with Faulty Body Mechanics and Painful Conditions of the Low Back, Leg, Knee, Foot, Upper Back, Neck, and Arm. No references are given in this section of the book and the material presented appears to be the concepts of the authors, based on their own experience. The discussion in relation to pain mechanisms, the indications for and the specific treatment recommendations are not in accordance with the opinions of many recognized medical authorities. The presentation is confusing, as an example: a "specific exercise" is described as "one that is corrective for the fault existing in a specific muscle or muscle group" and a "therapeutic exercise is one that is done in such a manner as to be corrective for the faults existing in the individual." No authority is given for the physiological basis of the statement that the purpose of massage is to "aid in relaxation of muscle through the effect on circulation." In addition to the physical therapy technics which are given in great detail, there is also included specific descriptions and indications for treatment by supportive measures such as back strapping, corsets, and shoe corrections.

Part IV is devoted to Prevention of Postural Faults, the developmental and environmental influeaces affecting posture. This section is concerned especially with postural habits in the growing individual, and the factor of habit is emphasized.

The authors state that they intend this book for those in the medical and allied fields who deal with problems of painful conditions resulting from faulty posture and add that it is also for those interested in the development of good posture. One wonders if this classification is to imply that the medical and allied professions are not interested in the development of good posture.

In order that the reader "without a background of highly specialized training" may read with understanding, the authors have devoted much unnecessary space to definitions of simple terms which are familiar to the physical therapist and certainly to the medical profession. The value of this book to the physical therapist is very limited as compared to "The Kendalls' " former publication.

Kinesiology in Nursing (Laboratory Manual). *By Bernice Fash, M.A., Cook County School of Nursing, University of Illinois; illustrated by Paul H. Stone. First edition; paper cover, price, $2.80; pp. 139, with illustrations. McGraw-Hill Book Company, Inc., New York, 1952.*

One of the McGraw-Hill series in nursing, this is a manual of elementary study in muscle function and body mechanics. It is written as a guide to both teacher and student in schools of professional and practical nursing and is intended to supplement continuous clinical instruction and practice. The facts and principles covered are applied to movements of the nurse herself as well as to the positioning and activity of the patient under her care.

The objective of the manual is to provide the nurse with basic information that will help her and the patient she attends to utilize their musculoskeletal systems in a mechanically efficient manner. It is emphasized that by so doing, unnecessary strain or deformity may be prevented and energy conserved, without sacrifice of required or recommended activity.

The manual is comprised of two parts. The first is headed *Introduction to Kinesiology*. It includes "rules" applied (a) to positions of recumbency, relating primarily to the patient and (b) to coordinated movements, relating primarily to the nurse; and a chapter on general functional anatomy. The second part aims to apply knowledge of joint and muscle action to situations commonly encountered by the nurse. Principle consideration is given to positioning of the patient in bed, getting the patient out of bed, and crutch walking. Each of these sections covers a very brief statement of the problem, student assignments (including blank forms for analysis of the muscle status of individual patients) and a series of drawings to illustrate the performance of selected muscle groups in a variety of rest positions and activities.

While the purpose of the manual is admirable, it seems to this reviewer that an attempt to present the extensive subjects of kinesiology, body mechanics and early functional training as applied to nursing, in a markedly simplified outline form, has resulted in a lack of clarity. Organization of the material is difficult to follow, partly because of inadequate headings for the written content and inadequate or incorrect labeling of the illustrations. (For example, figure 11 on page 13, showing the entire dorsal surface of the foot, is labeled *(syndesmosis: immovable joints)*. There are also accidental inaccuracies, such as "The combined shortening of all dorsal flexors results in drop foot" (page 36). The advisability of a few of the technics recommended may be questioned, for instance that shown in figure 83 in which the left triceps is being used much more strongly than the right as the patient rises from a right side-lying position.

The illustrative device of pictured forearms and hands to show muscle insertions and lines of pull is an aid to understanding in some cases (figure 81) and a cause of confusion in others (figure 69A).

Though one might well be puzzled by the choice of subjects and emphases in the manual, inclusions as contrasted with omissions, it must be remembered that the author was forced to sharply limit her coverage because of the space factor.

Regardless of the above comments, if the manual succeeds in focussing the attention of nurses on the importance to themselves and their patients of a fundamental knowledge of kinesiology and body mechanics, it will serve a worthwhile purpose.

Measurement and Evaluation in Physical, Health and Recreation Education. *By Leonard A. Larson, New York University and Rachel Dunaven Yocum, New York University. Hard cover; price, $7.50. Pp. 507, with illustrations. The C. V. Mosby Company, St. Louis, 1951.*

In this book, the place of measurement and evaluation has been related to the functions of general education. Although primarily concerned with physical, health and recreation education, information is provided which would be useful in any situation where evaluation and measurement technics should be employed. The text is developed around basic principles of education which insure recognition of the whole individual; mentally, physically, socially, and emotionally. These factors are considered throughout the entire presentation, although no attempt is made to present measurements or evaluations for factors other than physical except as they necessarily enter into physical performance. The book is divided into five sections.

Section I deals with the basic philosophy, aims and objectives of the health, physical education, and recreation program.

Section II presents the methods of measurement of organic functions, motor skills, knowledge, and individual adjustment to environment. Each of the chapters in this section, devoted to specific measurements, gives an excellent historical review of literature and condensation of available tests in each category. These tests are objectively described by "photocode," an unusual feature of this book, which translates detailed narrative explanations into illustrated action. All tests are reviewed as to reliability, objectivity, and validity. The appendix provides forms and directions for the administration of tests, scoring cards, and tables with norms for all established tests. The chapters on organic measurement of the human body will prove especially interesting to the physical therapist.

Section III is an evaluation of the various factors which must be determined to assure desirable educational outcomes from measurement.

Section IV, called "Analysis of Methods," presents statistical tools for use in descriptive statistics, the methods of choosing the most effective and valid statistical presentations for given data, and the criteria for selection of statistics to meet the conditions of the data being described. This section, concisely and clearly presented, is well worth a careful study by those undertaking research involving qualitative or quantitative data necessitating description, comparison, analyzation or graphic representation of results. The last chapter in this section is devoted to general principles of test construction with guides and criteria for construction of acceptable tests. This information is valuable for any educational field where few, if any, standard tests exist and the formulation of test devices is desirable.

Section V deals with the administration of the program of measurement and evaluation. Suggested methods for attaining success in the program based on administrative provisions are presented as general guides in planning.

Although many books and articles have been written on measurement and evaluation in physical education, this book has correlated the two in their total aspects as they relate to health, physical, and recreation education. As a text or reference it would be extremely valuable to both the student and the teacher, since it provides a compilation of existent measurements and an evaluation of them for use in either elementary or advanced courses. An excellent and complete bibliography is given at the end of each chapter which helps make this book highly useful in the field of educational measurements and evaluation.

The Electrical Activity of the Nervous System: *A Textbook for Students. By Mary A. B. Brazier, B.Sc., Ph.D. (London). Neurophysiologist, Massachusetts General Hospital, Research Associate, Harvard Medical School. Cloth, price, $5.00. Pp. 220; illus. 96. First edition. The Macmillan Company, New York, 1951.*

Great advances in neurophysiology have been made by laboratory and clinical investigators in recent years. Much of the information was obtained by studying the electrical activity of the nervous system. So much has been written that the author found the need and has successfully presented the subject in one volume. A brief presentation of the anatomy and the physiology of the nervous system introduces the subject of potential changes and excitability in nerve tissue. This is followed by a discussion of the nerve impulse and its propagation, both electrical and chemical, along the nerve fibre.

There is a chapter on "Transmission at Synapses" in which spatial summation, central excitatory state (C.E.S.), facilitation, occlusion, temporal summation, and recruitment are explained. Not only electrical potentials of the spinal cord but also those in the special sense organs are treated in individual chapters. The last four chapters deal with the normal and abnormal electrical changes observed in the brain.

The book is well written and thorough. Technical methods are not included because, as the author points out, technic is learned in the laboratory and is constantly changing with the development of new instruments.

There are many good illustrations throughout the text. Each chapter has its own complete and up-to-date bibliography. The book is highly recommended to physiology students, medical students, neurophysiologists, research workers in electrophysiology, as well as physical therapists and physiatrists.

Diathermy, Short Wave Therapy, Inductothermy, Epithermy, Long-Wave Therapy. *By William Beaumont, M.R.C.S., L.R.C.P., Director of Physical Medicine, Westminster Hospital, London. Second edition; cloth. Price, 21 shillings; pp. viii plus 230; illus. 114. H. K. Lewis and Company, Ltd., London, 1951.*

This textbook on diathermy, written for practitioners wishing to specialize in physical medicine and for persons training as physical therapists in England, is divided into chapters on physical principles, apparatus and measurements, physiological principles, technics, risks and dangers, and specific applications of diathermy to joints, soft tissue structures, suppurative conditions, organs of sense and systemic conditions (including artificial fever). It also contains a glossary of technical terms (mainly electrophysics) and index.

While the chapters on physical principles are adequate for a basic understanding of conventional and short wave diathermy, microwave is no more than mentioned as its use is not considered probable until some distant time in the future.

Such American authors as Osborne and Holmquest's "Technic of Electrotherapy" and Kovacs' "Electrotherapy and Light Therapy" list inflammatory and suppurative conditions as contraindications for use of diathermy, but Dr. Beaumont stresses the use of the high frequency electric field (condenser field) in suppurative conditions. The section on physiological and biological effects discusses the athermic as well as the primary thermic effects of diathermy as worthy of consideration, stating that it is "not possible to give explanation of nonthermal effects, but if the whole value of diathermy is summed up in one final verdict of heat production, it is the surest road to stagnation."

The emphasis on conventional diathermy and the high frequency electric field "through and through" technics, both of which are outmoded in the United States either by law (Federal Communications Commission requirements, effective July 1, 1952) or accepted usage (Council on Physical Medicine and Rehabilitation, American Medical Association), as well as the description of violet ray machines, conventional diathermy, the "Victor" inductotherm (the only example of an induction field diathermy machine—one no longer manufactured in the United States or usable by law after June 30, 1952) as "modern" equipment, plus the lack of description of crystal controlled and microwave diathermy, make this an out-of-date and therefore practically useless technical reference for American physical therapists and physicians.

Chiropodial Orthopaedics. *By Franklin Charlesworth, F.Ch.S., Consultant Chiropodist, Hope Hospital, Salford. Cloth binding; price, $5.50. Pp. 255; illus. 131. Williams and Wilkins Co., Baltimore, Md., 1951.*

The author, who is consultant chiropodist at Hope Hospital, Salford, England, has endeavored to place at the disposal of the reader the results of his investigations, experiments, and clinical tests in the field of foot therapy. He points out that in general the most successful results are achieved by making a cast of the foot and all shields, rest appliances, or corrective insoles made to fit exactly the contours of the foot for which they are made.

The first part of the book gives instruction for various methods of making casts using different materials. Then comes the making of appliances, protective and corrective, from a simple sponge pad to the more complicated blocked leather surgical insoles. Method and materials used are given in all cases.

The last two chapters are on interesting cases treated by the author; and on the chiropodial orthopaedic unit which would be best suited to a large hospital.

The print of headings and text of the book are clear as are the illustrations. A helpful index is included at the back.

To the reviewer the treatment described by the author is practical as it gives comfort, relief of strain, and stability to the patients' feet.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Foreign Notes and Quotes . . .

Rheumatoid Arthritis in Children (A Clinical Study). *By Borge Sury, M.D. Munksgaards Forlag, Copenhagen. Price, 10kr., 93 pages.*

Borge Sury is at present with the Physical Department of the Kommunehospital, Copenhagen. This book was written as a dissertation; it is written in English, as dissertations in Denmark often are. The following is a summary of his book by the author.

The main objective of the present work has been to elucidate the question as to whether Still's disease exists as a clinically well-defined disorder in children.

So far, opinions as to this question have differed, which has motivated a clinical study of a large series of cases in Denmark.

The chief conclusion of the work is that rheumatoid arthritis in children presents a wide range of forms, from the mild cases where few joints are involved to the severest forms resembling cases of sepsis with a grave prognosis.

The clinical picture originally described by Still represents the severest cases of rheumatoid arthritis in children, and occurs comparatively seldom in a Danish nonselected series of cases of this disease.

A distinction of these "Still's disease cases" according to his original criteria is not possible. It is not possible either to attempt a classification of rheumatoid arthritis in children in well defined clinical groups; there are combinations of the various forms.

Although the writer does not consider that it would be justifiable to maintain the concept of "Still's disease" in its original definition as a clinically well defined disease, it is suggested for the time being to distinguish rheumatoid arthritis in children as a special form of the disease.

It is shown that in various respects rheumatoid arthritis in children differs from the usual clinical picture in adults, and that the disease presents different aspects during the years before and at the commencement of puberty.

The disease is of most frequent occurrence in girls. The age-distribution curves show that during childhood the disease strikes with greater frequency from the second to the fourth years of life, and again the incidence is higher after the tenth year of life, the age when the disease changes into the adult type.

Rheumatoid arthritis in children begins in the large joints. This has been stressed by previous authors, but it has been the writer's experience that after the age of ten years or so a pronounced change occurs in small joints characteristic of primary rheumatoid arthritis in adults.

With regard to the clinical, pathologic-anatomical, and roentgenologic nature of the articular changes, rheumatoid arthritis in children does not differ decisively from the form of the disease seen in adults.

This is borne out in previous experience and in the case records in the present series of cases.

As to the extra-articular organic changes caused by rheumatoid arthritis, the writer's experience shows that the juvenile organism reacts in a manner of its own in this respect also.

In rheumatoid arthritis in children a band-shaped keratitis occurs which is remarkable for the fact that it may be present in eyes whose function is not impaired in other respects. This juvenile band-shaped keratitis, which appears before the tenth year, has not been described in rheumatoid arthritis in adults.

Further, it is shown that the disease in children surprisingly often associated with a chronic, serous, insidious iridocyclitis, undergoes a change after the age of ten years and is then characterized by more acute inflammatory changes, apparently forming a transition to the iritis seen in rheumatoid arthritis in adults.

As stressed by Portis (1938) the granuloma of Stein-Aschoff has not been found in the heart in cases of rheumatoid arthritis in children, whereas Baggenstoss and Rosenberg (1941) found typical granulomas in the heart in adult patients.

In the present series, histological examination of the heart has been made in one patient; there were moderate unspecific, subacute inflammatory changes of the myocardium.

Additional study of postmortem material will be required in order to supplement the hitherto few observations, but for the time being it would seem justifiable to consider the observations mentioned as circumstantial evidence showing that tissue reaction in the hearts of children with rheumatoid arthritis differs from that noted in cases of the disease in adults.

It is impossible to give an explanation of the change observed in some of the clinical manifestations of rheumatoid arthritis in the course of the years before and at the commencement of puberty. There is a supposition that a change of the hormonal milieu may play a part. Further, it is possible that the immunological conditions of the organism may be of importance. Investigations into the agglutination reaction with haemolytic streptococci have shown that serum from patients with rheumatoid arthritis under ten years of age is not at all capable of agglutinating haemolytic streptococci.

Contributed by Mrs. Rudie Agersnap, Secretary of the Danish Physical Therapy Association.

Our Book Reviewers for August

Elizabeth Addoms, Technical Director, Physical Therapy Section, New York University, New York City.

Gertrude Beard, Associate in Physical Medicine, Northwestern University; Technical Director, Course in Physical Therapy, Northwestern University Medical School, Chicago, Ill.

Lillian Chabala, Instructor and Supervisor of Directed Practice, University of Southern California, Los Angeles.

Dorothy Graves, Assistant Professor, School of Physical Therapy, University of Southern California, Los Angeles.

William J. Shriber, Assistant in Medicine, Physical Medicine, Massachusetts General Hospital, Boston, Mass.

Frances S. Turtle, Clinical Supervisor, Physical Therapy, Peter B. Brigham Hospital, Boston, Mass.

Elizabeth C. Wood, Associate in Physical Medicine, Northwestern University Medical School, Chicago, Ill.

Schools of Physical Therapy

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS
OF THE AMERICAN MEDICAL ASSOCIATION

Graduates of these schools are eligible for membership in the American Physical Therapy Association.

Name and Location of School	Medical Director and Technical Director	Entrance Requirements	Length of Course	Classes Start	Certificate, Degree, or Diploma
CALIFORNIA					
[1]**Childrens Hospital Society,** Los Angeles (in affiliation with University of California, Los Angeles)	Samuel S. Mathews, M.D. Mary J. Dodge	a[3]-b[3]-d-e g[4]	14 mo 4 yrs	Sept	Certificate Degree
[1]**College of Medical Evangelists,** Loma Linda	F. B. Moor, M.D. R. Wm. Berdan	a-b-c-d-e g	15 mo 4 yrs	Sept	Certificate Degree
[1]**Univ. of So. California,** Los Angeles	Charles L. Lowman, M.D. Charlotte W. Anderson	a-b-d-e g[4]	14 mo 4 yrs	Sept Sept-Feb	Certificate Degree & Cert.
[1]**Univ. of California Medical School,** San Francisco	Lucile M. Eising, M.D. Margery Wagner	d-e g	12 mo 4 yrs	Sept-Feb	Certificate Degree
[1]**Stanford Univ.,** Palo Alto	Wm. Northway, M.D. Lucille Daniels	a-d-e-f g[4]	12 mo 4 yrs	Jan-June or Sept	Certificate Degree
COLORADO					
[1]**Univ. of Colorado Medical Center,** Denver	Harold Dinken, M.D. Dorothy Hoag	a[3]-b-d-e g[4]	12 mo 4 yrs	Sept	Certificate Degree
ILLINOIS					
Northwestern Univ. Medical School, Chicago	Emil D. W. Hauser, M.D. Gertrude Beard	a-b[2]-d-e	12 mo	Oct	Certificate
IOWA					
[1]**Univ. of Iowa,** Iowa City	W. D. Paul, M.D. Olive C. Farr	b-e	12 mo	Sept	Certificate
KANSAS					
[1]**Univ. of Kansas School of Medicine,** Kansas City	Donald L. Rose, M.D. Ruth Monteith	a-b-d-e g[4]	12 mo 4 yrs	Feb-Sept	Certificate Degree
MASSACHUSETTS					
Bouve-Boston School, in affiliation with Tufts College, Medford 55	Howard Moore, M.D. Constance K. Greene	g[4]	4 yrs	Sept	Degree
Simmons College, Boston	{Wm. T. Green, M.D. {Arthur L. Watkins, M.D. Shirley Cogland	a[3]-b-d-e g[4]	16 mo 4½ yrs	Sept	Diploma Degree
Boston Univ., Sargent College of Physical Education, Cambridge	Kenneth Christophe, M.D. Adelaide McGarrett	a-b-d-e f-g[4]	12 mo 2 or 4 yrs	Sept	Certificate Degree
MINNESOTA					
[1]**Univ. of Minnesota,** Minneapolis	Frederic J. Kottke, M.D. Ruby Green Overmann	d-f-g[4]	2 yrs	Sept	Degree
[1]**Mayo Clinic,** Rochester	Earl C. Elkins, M.D. Darrell Hunt	a-b-c-d-e	2 yrs	Sept	Certificate
MISSOURI					
[1]**Washington Univ. School of Medicine,** St. Louis	Sedgwick Mead, M.D. Beatrice F. Schulz	f-g[4]	2 or 4 yrs	Sept	Degree
[1]**St. Louis Univ. School of Nursing,** St. Louis	A. J. Kotkis, M.D. Sr. Mary Imelda	f-g[4]	2 or 4 yrs	Jan-Sept	Degree

Name and Location of School	Medical Director and Technical Director	Entrance Requirements	Length of Course	Classes Start	Certificate, Degree, or Diploma
NEW YORK					
Albany Hospital, Albany (in affiliation with Russell Sage College, Troy)	John W. Ghormley, M.D. Catherine Graham	a-b-d-e g[4]	12 mo 4 yrs	Sept	Certificate Degree
[1]**Columbia Univ.,** New York	Wm. B. Snow, M.D. Floy Pinkerton	a-b[3]-e f	12 mo 2 yrs	Sept	Certificate Degree
[1]**New York Univ., School of Education,** New York	George G. Deaver, M.D. Elizabeth C. Addoms	a[3]-b[3]-d-e g[4]	12 mo 4 yrs	Sept	Certificate Degree
NORTH CAROLINA					
[1]**Duke Univ., School of Medicine,** Durham	Lenox Baker, M.D. Helen Kaiser	a[3]-b[3]-d-e	15 mo	Oct	Certificate
OHIO					
[1]**Cleveland Clinic,** Cleveland	Walter J. Zeiter, M.D. Mildred Heap	a-b-d-e	12 mo	Oct	Certificate
PENNSYLVANIA					
[1]**D. T. Watson School of Physiatrics,** Leetsdale	Jessie Wright, M.D. Kathryn Kelley	a[3]-b[3]-d-e	12 mo	Oct	Diploma
[1]**Univ. of Pa. School of Auxiliary Med. Serv.,** Division of Physical Therapy, Philadelphia	George M. Piersol, M.D. Dorothy Baethke	e g[4]	12 mo 4 yrs	Sept-Feb Sept	Certificate Cert. & Degree
TEXAS					
[1]**Hermann Hospital,** Houston	Oscar O. Selke, Jr., M.D.	a-b-d-e	12 mo	Oct	Certificate
[1]**Univ. of Texas School of Medicine,** Galveston	G. W. N. Eggers, M.D. Ruby Decker	a-b-e d	12 mo	Jan	Certificate Degree
VIRGINIA					
[1]**Med. College of Va.,** Baruch Center of Phys. Med., Richmond (in affiliation with Richmond Prof. Inst.)	Walter J. Lee, M.D. Susanne Hirt	a-b-d-e g[4]	12 mo 4 yrs	Sept	Diploma Degree
WISCONSIN					
[1]**Univ. of Wisconsin Med. School,** Madison	Harry D. Bouman, M.D. Margaret Kohli	a-b-c-e-f g[4]	12 mo 4 yrs	Sept Sept-Feb	Certificate Cert. & Degree
U. S. ARMY MEDICAL SERVICE					
Medical Field Service School, Brooke Army Medical Center, San Antonio, Texas, and Fitzsimons, Walter Reed, or Letterman Army Hospitals	Charles D. Shields, Lt. Col., M.C. Agnes P. Snyder, Major, WMSC	e	12[2]	Mar-Sept	Certificate

Entrance Requirements

FOR ONE-YEAR COURSE

a = Graduation from accredited school of nursing.
b = Baccalaureate degree with major in physical education.
c = Two years of college with science courses.
d = Three years of college with science courses.
e = Baccalaureate degree with required science courses.

FOR TWO-YEAR COURSE

f = Two years of college with science courses.

FOR FOUR-YEAR COURSE

g = High school graduation.

Footnotes

[1]Male students admitted.

[2]Apply directly to the Surgeon General, Department of the Army, Washington 25, D. C.

[3]Additional college science credits required.

[4]Advanced standing students accepted.

Please address initial correspondence to the School of Physical Therapy in the institutions listed. Tuition and fees will vary from school to school.

Classified WANT-ADS

WANTED: PHYSICAL THERAPIST, graduate of approved school to assist in treatment center, primarily with cerebral palsy. For information write: Harry C. Patchin, Executive Secretary, Tri-County Crippled Children's Association, Harrisburg, Pa.

WANTED: Physical therapist, qualified, female. Physical therapy service in homes, also physical therapy clinics working closely with orthopedic treatment clinics and diagnostic clinics. Excellent starting salary. Car is necessary. Other benefits include two weeks annual sick leave which is accumulative to ninety days, three weeks annual vacation, and a retirement plan. Write: Director, R. L. Loftin, M.D., Bay Co. Dept. of Health, Bay Co. Bldg., Bay City, Michigan.

WANTED: IMMEDIATELY, 2 qualified female physical therapists. September 1, 1952, 1 female physical therapist. General Hospital Clinic with outpatient service. No cerebral palsy, polio or mental cases. Five day, 40-hour week, holiday, sick leave and vacation privileges. Quarters optional. Good beginning salary. Annual increases. Write to Miss Miriam E. Miller, The Johns Hopkins Hospital, 601 N. Broadway, Baltimore 6, Md.

WANTED: Qualified physical therapist for Crippled Children's Hospital. Write Miss Fannie Fox, Administrator, Texas Elks' Children's Hospital, P.O. Box 7, Ottine, Texas.

WANTED: Physical therapist (qualified) to head growing department in 260-bed hospital with adjacent medical building. Equipment new and complete. Excellent working conditions. Good starting salary. Write W. C. Perdew, Superintendent, Bronson Methodist Hospital, Kalamazoo, Michigan.

PHYSICAL THERAPIST for 250-bed general hospital. Work primarily with polio patients. Excellent salary with opportunity for advancement. Permanent. Baptist Hospital, Alexandria, Louisiana.

POSITION NOW OPEN. Female physical therapist, assistant, expanding department, treating all types of crippled children, good salary, excellent conditions, 40-hour week. Blue Cross and Group Life Insurance available. Phone or write Children's Hospital, Akron, Ohio.

WANTED: PHYSICAL THERAPIST, qualified, female, for 500-bed general hospital; modern department; salary good; 40-hour week; paid vacation, sick leave; living quarters available if desired. Apply Personnel Department, Grace Hospital, Detroit, Michigan.

WANTED: Qualified physical therapists, male or female. Large well equipped department. Wide variety of cases. Medical supervision—diplomates American Board. Apply: Miss Lorena James, Cook Co. Hosp., Box 191, Chicago 12, Ill.

PHYSICAL THERAPIST (female) for 200-bed general hospital on San Francisco Peninsula. Graduate of A.M.A. approved school. Excellent salary, vacation and sick leave policy. Forty-hour work week. Community Hospital, 210 39th Avenue, San Mateo, California.

WANTED: Qualified female physical therapist. Well equipped department 135-bed general hospital. 200-bed hospital under construction. Good salary. Liberal sick leave and vacation privileges. Write to Miss Edith Snow, P.T., Rockford Memorial Hospital, 507 Chestnut St., Rockford, Illinois.

QUALIFIED PHYSICAL THERAPIST wanted for special treatment center, rehabilitation, and convalescent hospital. Must have experience in corrective exercises for arthritic patients. Good salary with regular semi-annual increases; 37½-hour weekly. New building. Apply: Administrative Manager, Angelus Convalescent Hospital and Nursing Home, Inc., 200 Amber St., Pittsburgh 6, Pa. Phone: Emerson 1-2455.

PERMANENT STAFF POSITION FOR PHYSICAL THERAPIST. Graduate of accredited school, good starting salary with regular increases; to work with neuromuscular disabilities (multiple sclerosis, polios, spastics, etc.) in the Kabat-Kaiser Institute, Santa Monica, California. Vacation with pay, sick leave, etc. Write: The Administrator, Kabat-Kaiser Institute, 1815 Ocean Front, Santa Monica, Calif.

PHYSICAL THERAPIST, APTA or Registry member only, wanted for rehabilitation institute in Washington, D. C. Treatment by muscle re-education of paralysis resulting from neuromuscular diseases or injuries. All therapy given under close supervision of physicians. Excellent beginning salary with regular increases. Paid vacations; sick leave; free hospitalization insurance. Give age, references, picture, and date of availability. Address replies to Box 36, care of the Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

PHYSICAL THERAPIST, qualified, wanted in 113-bed hospital located near Chicago, Illinois. Newly organized and active department. Excellent salary, vacation and sick leave policy. Apply Personnel Director, Highland Park Hospital, Highland Park, Illinois.

RATES

The rate per insertion is 75c per line. Typewrite your advertisement carefully and count 50 characters and spaces per line.

ALL WANT-ADS MUST BE PAID FOR IN ADVANCE. Make checks or money orders payable to the American Physical Therapy Association.

Institutions or physical therapists who do not wish their identity known may arrange for Blind Ad Code No. All such want-ads must include the following which will be counted as 2 lines:

Address replies to ..... care of **The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.**

It is requested that descriptive adjectives be used instead of actual figures when referring to salary.

IMPORTANT

It is understood and agreed that the publisher shall have the right to reject or change the wording of any advertisement which in the opinion of the Editorial Board shall not be in agreement with the ethical standing of this publication; the advertiser agreeing that the Editorial Committee shall be the sole and exclusive judge of the acceptance of any advertisement.

DEAD LINE

Copy for want-ads must be submitted to the American Physical Therapy Association by the 1st of the month **PRECEDING MONTH OF ISSUE.**

Chapter Directory

Alabama

President, George Beni Arnold, 121 S. Ann St., Mobile 20
Secretary, Kay Carr, 324 41 St., Fairfield

Arizona

President, Mrs. Mary T. Lyons, 1948 E. 7 St., Tucson
Secretary, Margaret Curry, 334 E. Lee St., Tucson

Arkansas

President, Geraldine Larson, 2112 Riverview, Little Rock
Secretary, Ewing Guthrie, 314 N. Spruce, Little Rock

California

Northern California:
President, Maxine Schuldt, 1680 Mission St., San Francisco
Secretary, Mrs. Margaret B. Farley, 2620 McAllister St., San Francisco
San Diego:
President, C. Ruth Campbell, 1410 Fort Stockton Dr., San Diego
Secretary, Anna J. Janett, 525 Kalmia, San Diego
Santa Barbara:
President, Mrs. Rhoda Roberts, Ventura Co. Hosp., Ventura
Secretary, Mary Isham, 1734 State St., Santa Barbara
Southern California:
President, Mrs. Roxie Morris, 9616 San Gabriel St., South Gate
Secretary, Lillian Chabala, 1135 Pagoda Court, Los Angeles 31

Colorado

President, Katharine Chilcote, 1727 Beeler St., Aurora
Secretary, Virginia Vickers, 756 Colorado Blvd., Denver

Connecticut

President, Herbert Jones, Hosp. for Chronic Illness, Rocky Hill
Secretary, Victoria Preitner, Hosp. for Chronic Illness, Rocky Hill

Delaware

President, Jean Wiley, 42 Hurst Rd., Deerhurst, Wilmington
Secretary, Wilhelmina Werkhoven, 1801 Harrison Ave., Gwinhurst, Wilmington

District of Columbia

President, Vida Jo Niebuhr, 9011 Mohawk Lane, Bethesda, Md.
Secretary, Sally Hale, 65 Hawaii Ave., N.E., Washington 11

Florida

President, Edna Knowlton, Box 204, Tallahassee
Secretary, Carolyn Blair, Box 1028, Tallahassee

Georgia

President, Mrs. Hazel Stephens, Warm Springs Found., Warm Springs
Secretary, Genevieve Collins, Warm Springs Found., Warm Springs

Idaho

President, Christine K. Kline, 1702 Jefferson St., Boise
Secretary, Anna Sweeley, 1719 N. 18 St., Boise

Illinois

President, Jean Roland, 2301 W. Farwell Ave., Chicago
Secretary, Beatrice Bozarth, 4206 N. Winchester Ave., Chicago 18

Indiana

President, Geraldine Arnold, V.A. Hospital, 1481 West 10th, Indianapolis
Secretary, Barbara Nash, 3050 Broadway, Indianapolis
Northern Indiana:
President, Virginia Fitch, 2626 Erskine Blvd., South Bend 14
Secretary, Edna Schmidt, Physical Therapy Dept., St. Joseph's Hospital, South Bend

Iowa

President, William Jahnke, 20½ E. Market, Iowa City
Secretary, Mrs. Leila Green, 329½ E. Church, Iowa City

Kansas

President, Minerva W. Cheshire, 426 S. Green, Wichita 7
Secretary, Mrs. Fern Parker, 1002 N. Ridgewood, Wichita

Kentucky

President, Mary McDonnell, 507 Cumberland Apts., Louisville
Secretary, Mary L. Donovan, V.A. Hospital, Louisville

Louisiana

President, Audrey Ullman, 1632 Fourth St., New Orleans
Secretary, Merton Miller, 6001 Mandeville St., New Orleans

Maine

President, Lois M. Burns, Hyde Mem'l Home, Bath
Secretary, Rowena Walden, Me. Gen'l Hosp., Portland

Maryland

President, Mary McDowell, 1923 Taylor Ave., Baltimore 14
Secretary, Edith Flavin, Childrens Rehabilitation Institute, Cockeysville

Massachusetts

President, Virginia Greenwood, 23 Oxford Rd., Newton Center
Secretary, Ruth Langley, 331 N. Main St., Randolph

Michigan

President, Mabel Holton, W. A. Foote Mem'l Hosp., Jackson
Secretary, Marjory W. Ketchum, 933 Airport Road, Muskegon Hgts.

Minnesota

President, Hazelle M. Erickson, 515 S.E. Delaware, Minneapolis
Secretary, Annette Larson, 156 Taylor Avenue, Ft. Snelling, St. Paul 11
Southern Minnesota:
President, Esther Swartz, 15 12 Ave., N.W., Rochester
Secretary, Mrs. Irene Koshire, 1015 West Center St., Rochester

Missouri

Eastern Missouri:
President, Mrs. Lillian Thom, 8845 Eager Rd., Richmond Heights
Secretary, Joseph Savan, 5800 Clemens, St. Louis 12
Western Missouri:
President, LaVerne McNabb, 610 Orient Dr., Kansas City, Kans.
Secretary, Mrs. Gloria Morton, 148 Pawnee, Lawrence, Kans.

Montana

President to be appointed.
Secretary, Dora Dykins, 214 Hawthorne Ave., Lewistown

Nebraska

President, Mrs. Mary Lindball, 3604 Grant St., Omaha
Secretary, Mrs. Betty Soder, 611 N. 42 St., Omaha

New Hampshire

President, Ruth Murray, River Rd., Penacook
Secretary, Mary Bullock, R.F.D. #4, Concord

New Jersey

President, Marie Heghinian, 307 Fairmount Ave., Jersey City 6
Secretary, Althea M. Jones, 136 W. 1 St., Clifton

New Mexico

President, Mrs. Margaret B. Evanko, Lovelace Clinic, Albuquerque
Secretary, Hilda Voetberg, 58 S. Federal Pl., Santa Fe

New York

Central New York:
President, Donald McCuen, 101 Downing Rd., DeWitt
Secretary, Theodora White, 93 Hartford Terrace, New Hartford
Eastern New York:
President, Elizabeth Ammerman, 2174C Eastern Parkway, Schenectady
Secretary, Betty Nichols, 30 Front St., Schenectady
New York Chapter:
President, Elizabeth Addoms, 1 Clark St., Brooklyn 2
Secretary, Stacy Psychoyos, 616 E. 26 St., Brooklyn 10
Western New York:
President, Martha Morrow, Physical Therapy Department, Strong Memorial Hospital, Rochester
Secretary, Dorothy Shaw, 333 Ashland Ave., Buffalo

North Carolina

President, Celeste Hayden, State Board of Health, Raleigh
Secretary, Mrs. Sally M. Lowe, Rex Hospital, Raleigh

Ohio

President, Sarah Martz, V.A., Cuyahoga Bldg., Cleveland 14
Secretary, Lucy Jones, Crile V.A. Hospital, Cleveland

Oklahoma

President, Alice Moller, 1451 S. Quaker, Tulsa
Secretary, Dorothy Fugirt, 4900 S. Lewis Ave., Tulsa

Oregon

President, Mercedes Weiss, 2134 S.E. 57 Ave., Portland
Secretary, Elizabeth Fellows, 1535 S.W. 11 Ave., Portland Rehab. Center, Portland

Pennsylvania

President, Ruth M. Guerin, 6491 Woodcrest Ave., Philadelphia 31
Secretary, Helen F. Snelbaker, 1311 Finance Bldg., Philadelphia 2
Western Pennsylvania:
President, Margaret P. Carlos, Devonshire Apts. F-3, 4910 Center Ave., Pittsburgh
Secretary, Mrs. Dorothy Noble, 2 Bayard Ave., Pittsburgh

Puerto Rico

President, Priscilla Jusino, Apt. 1B, 562 Trigo St., Stop 13, Santurce
Secretary, Alice Torres-Bulls, Box 1927, San Juan

Rhode Island

President, Matilda Holanetz, 34 Atlantic Blvd., Centerdale 11
Secretary, Mary DuVally, 197 Calla St., Providence

South Carolina

President, Margaret W. Graydon, Columbia Hospital, Columbia
Secretary, Mrs. Winifred Werry, King & Wilmington, Beaufort

South Dakota

President, Carol Spensley, c/o P.T. Dept., Royal C. Johnson Mem'l Hosp., Sioux Falls
Secretary, Katharine J. Gale, 222 N. Grange, Sioux Falls

Tennessee

President, Deborah Kinsman, 3608 Brighton Rd., Nashville
Secretary, Mrs. Helen T. Nail, State Health Dept., 420 6 Ave. N., Nashville

Territory of Hawaii

President, Henry N. Thompson, Jr., Kauikeolani, Children's Hosp., 226 N. Kuakini St., Honolulu 17
Secretary, pending

Texas

President, Mrs. Marion M. Boyer, 4318 Lemmon, Dallas 4
Secretary, Jeanne Schenck, 2313 6 Ave., Ft. Worth

Utah

President, Robert G. Green, 981 S. 10 E. St., Salt Lake City
Secretary, Mrs. Johnell Yurka, 2623 Alden, Salt Lake City

Vermont

President, Margaret Corbin, Mary Fletcher Hosp., Burlington
Secretary, Veronica Cullinan, 159 S. Union St., Burlington

Virginia

President, Susanne Hirt, P.T. School, Med. College of Va., Richmond
Secretary, Sarah Jean Smith, 3107 Stonewall Ave., Richmond

Washington

President, Carolyn Bowen, 8623 41 St., S.W., Seattle 6
Secretary, Barbara Fassett, 100 Crocket St., Seattle 9

West Virginia

President, Mrs. Marguerite C. Rukse, Box 85, Amherstdale
Secretary, Mrs. Georgia Traub, Morris Memorial Hosp., Milton

Wisconsin

President, Norma M. Grundemann, 3617 N. 13 St., Milwaukee 6
Secretary, Alice I. Butler, 1218 Spring St., Madison

...You can help—

...*during* the critical convalescent period of patients in U. S. Air Force hospitals. Day after day, more sick and wounded airmen add to the already heavy burden imposed upon the Air Force Hospital professional teams. *They need your help.*

And now, with an expanding Air Force, there is a greater need than ever before for more physical therapists who can help return these men to health by application of massage, electrotherapy, hydrotherapy and other therapeutic exercises.

Commissioned as an officer in the Women's Medical Specialist Corps, you will encounter the greatest possible variety of cases. You will employ newest methods of treatment and latest equipment—you will enhance your professional experience immeasurably. For details, including the many personal advantages offered you by the Women's Medical Specialist Corps, *Write today* to Surgeon General, United States Air Force, Washington 25, D. C.

U. S. AIR FORCE

MEDICAL SERVICE